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**MULTIPLE PHYSICIANS
FURNISHING SURGERY**

Final Report

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1.0 INTRODUCTION

1.1 Statement of the Problem

On January 1, 1992, Medicare began reimbursing physicians through a fee schedule derived from a resource-based relative value scale (RBRVS). The fee schedule was developed using physician survey data which estimated the amount of work associated with particular services, such as surgical procedures. In the survey, it was assumed that all of the work associated with a particular service would be provided by a single physician, and the resource-based fee schedule reflects this assumption. For surgical procedures, this single-physician single-bill concept is embodied in the global service concept. However, many surgical procedures may deviate from this single-physician single-bill model in several ways.

First, many surgical procedures are performed with the use of an assistant surgeon, who may be directly reimbursed by Medicare in addition to the primary surgeon. (Surgical residents and physicians' assistants may also assist at surgery, but they are not directly reimbursed by Medicare for these services.) The use of assistant surgeons may benefit the primary surgeon by reducing the work required of him without reducing his payment. In many instances, no similar or comparable benefits accrue to the Medicare program or to its beneficiaries: when performed by a primary and an assistant surgeon, a surgical procedure such as a cholecystectomy may simply cost more.

Second, the single-physician model envisioned by RBRVS does not hold when two surgeons perform different procedures through the same incision. For example, 4.5 percent of patients receiving CABG surgery also receive a valve replacement procedure from a different surgeon during the same operating room session (Center for Health Economics Research, unpublished data). Temporally, the CABG procedure would follow the valve replacement. Theoretically, then, the CABG procedure would require somewhat less work than envisioned by the relative fee schedule, since exposure of the heart and establishment of cardiopulmonary bypass would already have been accomplished. Similarly, the surgeon performing the valve replacement would not need to close the pericardium or chest wall, although these steps are

included in the resource-based fee for the procedure. It is possible that, across all types of surgical procedures, total work reductions resulting from combining surgical procedures may result in a significant overpayment in a relative-value reimbursement system.

Third, surgeons deviate from the global service model when they unbundle services covered by a single global fee and bill the services separately. For example, 70 percent of Medicare carriers consider insertion of a chest tube to be included in the global fee for CABG procedures. However, surgeons performing CABGs occasionally either bill separately for insertion of the chest tube or they may request another physician to perform and bill for the procedure. The global fee definitions used in the fee schedule include only those services provided by the primary surgeon. To the extent that other physicians perform these tasks, the primary surgeon has less work to do while Medicare's outlays increase.

Physicians may also perform two unrelated procedures through different incisions during the OR session. In such cases, there may be no reduction in work for either surgeon, and reductions in reimbursement may not be appropriate. (It is possible, however, that anesthesiologists realize some work reductions relative to reimbursement in these cases.)

The objective of this study is to estimate the magnitude of potential work reductions relative to reimbursement under HCFA's fee schedule, through the use of assistant surgeons, unbundling, and same-incision surgery.

1.2 Executive Summary

The recently-introduced Medicare physicians' fee schedule was based in part on the assumption that a given medical or surgical procedure constitutes a discrete bundle of work that is performed by, or under the supervision of, a single physician, and that appropriate reimbursement for the procedure can be determined largely by estimating the amount of work included in the bundle.

In the real world, however, surgical procedures constitute bundles of work that are often "unbundled" in various ways, for example, through the use of an assistant surgeon or

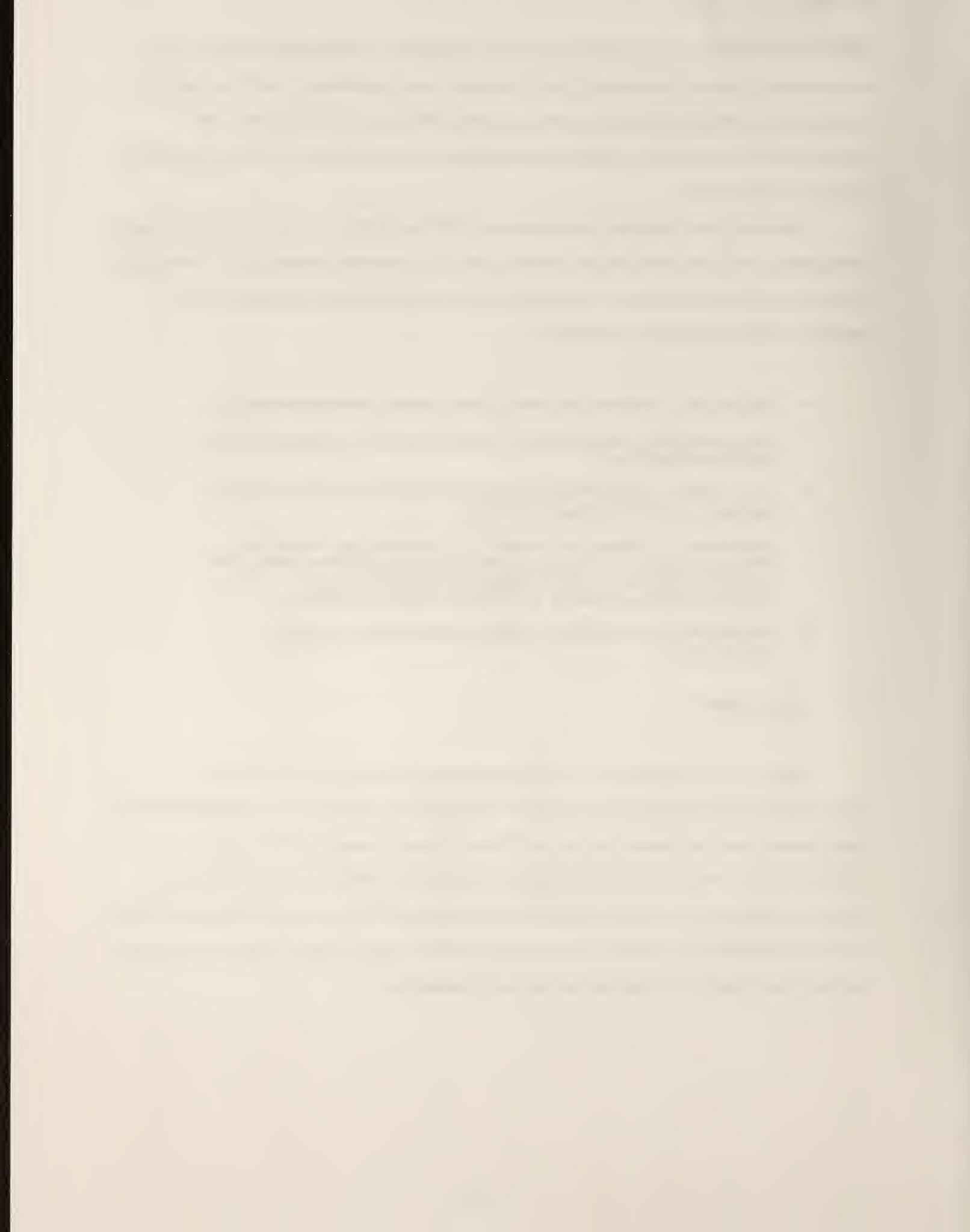
through separate billing for procedures normally included in global reimbursement. The assumptions of the fee schedule may also be violated when two distinct, unrelated surgical procedures are provided through the same surgical incision, in which case the work component of each procedure is reduced somewhat (since incision and closure of the surgical wound occur only once).

This study uses Medicare claims data from 1986 and 1989 to examine potential issues of overpayment under the Medicare fee schedule resulting from such unbundling or overlapping of discrete surgical procedures. Thirty-three major surgical procedures were chosen for analysis. For each procedure, we present:

- frequencies, variations, and trends in the rates of assistance at surgery;
- mean and total reimbursement for surgical assistants compared to that for primary surgeons;
- mean relative value per case of work performed by assistant surgeons, compared to that by primary surgeons;
- frequencies, variations, and trends in the unbundling of secondary procedures that are usually included in the global reimbursement for the primary procedure, with estimates of total Medicare reimbursement and relative work values of such procedures;
- frequencies of overlapping, unrelated "same-incision" surgical procedures.

1.2.1 Study Methods

From a list of 200 high-cost CPT procedures provided by HCFA, thirty-three homogeneous groups of surgical procedure codes were chosen for analysis, after eliminating minor procedures and non-surgical codes. These 33 groups comprised 98 individual procedure codes. We identified beneficiaries with one or more paid Medicare physician claims containing one of these 98 codes in the 1986 and 1989 5 percent BMAD Beneficiary Files, and re-abstracted the two BMAD files to obtain all other surgical claims with the same dates of services and beneficiary identifiers as the study procedures.



All claims for each beneficiary-date of service combination were considered to constitute an "episode of surgery;" that is, an episode consists of all surgical procedures provided to a single beneficiary on a single date of service. Two analytic files were constructed, one for 1986 and one for 1989. Each episode-level record contained:

- claims data for all surgical procedures provided during the single-day episode;
- relative work values for all surgical procedures;
- characteristics of the beneficiary; and
- characteristics of the hospital, if the episode occurred during an inpatient stay (determined by matching dates with MEDPAR claims).

Within each episode of surgery, the surgical procedure with the highest allowed charge was considered to be the principal or "index" surgical procedure, and the provider identified on this claim was considered the primary surgeon. Claims for other same-day surgical procedures were classified as "assistance at surgery" (if the procedure code fell into the same narrowly-defined family of codes as the index procedure) or as a "secondary procedure."

To further classify secondary procedures, we asked surgical consultants to tell us whether, for a given combination of index and secondary procedures, the secondary procedure was usually:

- considered part of the global package of services reimbursed under the index procedure;
- usually performed through the same incision as the index procedure; and
- usually therapeutic rather than diagnostic.

Such classification allowed us to analyze the extent of unbundling during a single-day episode of surgery, and to estimate the extent to which same-incision surgery creates possible distortions in reimbursement under the Medicare fee schedule.

It is important to note that our claims-based analysis included only those physicians who submit bills to and are reimbursed directly by Medicare. Surgical residents, for example, may assist at surgery but are not reimbursed directly by Medicare; they are therefore not included in this analysis. However, it is appropriate to exclude such non-billing physicians for this analysis, since the policy questions addressed here involve the impact of Medicare-reimbursed work-sharing on the fixed-price-per-surgical-package concept that underlies the Medicare fee schedule.

1.2.2 Results

Assistance at Surgery

For the 33 index procedures included in this study, total Medicare-allowed charges for primary surgeons grew by 18.8 percent (\$3.3 billion) between 1986 and 1989, reflecting changes in volume, price, and case mix. By comparison, total allowed charges for assistant surgeons for these procedures grew by 23.1 percent (\$48.2 million) over the same period. This increase can be decomposed into four vectors, reflecting changes in

- total surgical volume for these 33 procedures;
- the frequency with which assistant surgeons are used;
- the mean allowed charge paid to each assistant surgeon; and
- the distribution ("case mix") of assistant surgeons across the 33 procedures.

The bulk of this \$48.2 million increase (61 percent) can be attributed to an increase in the total volume of surgery (holding constant the frequency of assistance at surgery between 1986 and 1989). In fact, the number of claims for assistant surgeons decreased slightly between 1986 and 1989, from 25.8 percent to 25.4 percent of claims for primary surgeons; had other factors remained constant, this would have resulted in a 7.1 percent decrease in spending for assistant surgeons between 1986 and 1989. Despite this slight decline in use of assistants, a shift in case mix occurred, so that assistants in 1989 were more likely to be used in procedures where reimbursement was higher; this factor accounted for 31 percent of the \$48 million increase in

assistant surgeon spending. Finally, 11 percent of the spending increase was due to an increase in the mean allowed charges paid to assistant surgeons, after controlling for changes in surgical volume and the frequency and distribution of surgical assistant claims.

Since 1982, Medicare has required that carrier's mean allowed charges for assistance at surgery be no more than 20 percent of mean allowed charges for the primary surgeon. However, we found that in 1989, mean allowed charges for assistant surgeons were 25.8 percent of primary surgeons' charges. Our higher-than-expected results may reflect several factors; one important factor is undoubtedly the failure of some physicians to use appropriate type-of-service and modifier codes, making it difficult for carriers and researchers to readily distinguish assistant surgeons' claims from repeat procedures and other claims.

The frequency with which assistant surgeons are used varied greatly across the 33 procedures. As measured by claims data, assistants are used in more than two-thirds of cases of CABG surgery and aortic or mitral valve replacement. In contrast, assistants were used in less than one percent of cases of TURP and D & C.

Use of surgical assistants was found to vary substantially by hospital characteristics: non-teaching hospitals, smaller hospitals, and for-profits have higher rates of assistance. Use of assistants was higher in the Pacific and Mountain census divisions. Geographic variation may be related to carrier regulations or to other factors, such as the geographic distribution of teaching hospitals. Rates of surgical assistants also varied by patient age and race, but not by gender: rates were higher for the very old, and for whites compared to blacks.

Using the procedure-specific relative work values included in the fee schedule, we estimated the amount of work provided by assistant surgeons. Overall, the relative work value per case for assistant surgeons was 5.1 percent of the relative work value for primary surgeons; variation in this figure across procedures reflects differences in the frequency with which assistants are used.

Procedures Billed Outside of the Global Package

Our surgical consultants told us which frequently-billed secondary procedures were usually reimbursed with the index procedure as part of a global package of services. Total allowed charges for such "unbundled" procedures increased by 43 percent between 1986 and



1989; however, in both years, reimbursement for unbundled procedures amounted to less than one percent (\$30.2 million in 1989) of allowed charges for primary surgeons. Considerable variation was noted across procedures, with many showing no unbundling.

Procedures Performed Through the Same Surgical Incision

Between 1986 and 1989, total allowed charges for same-incision procedures increased by 77 percent, and in 1989 amounted to 2.3 percent (\$75.9 million) of allowed charges for primary surgeons. Most same-incision procedures were therapeutic rather than diagnostic, and most were concentrated in a few of our 33 procedure groups, such as enterectomy, aortic and mitral valve replacement, knee arthroscopy, and PTCA (Appendix B).

1.3 Conclusions and Policy Recommendations

1.3.1 Use of Assistant Surgeons

Our results show that total allowed charges for assistant surgeons increased by 23.1 percent (\$48.2 million) between 1986 and 1989. Most (61 percent) of this increase is attributable to an increase in the total volume of surgery, with another 31 percent attributable to a shift in case mix towards more complex surgical cases. Only 11 percent of the rise in total allowed charges was due to an increase in the mean allowed charges paid to assistant surgeons. Between 1986 and 1989, the number of claims for assistant surgeons, as a proportion of all surgical claims, actually decreased slightly from 25.8 percent to 25.4 percent. Overall, there was no evidence of excessive growth in the use of assistant surgeons or total Medicare spending for such services.

Trends in the frequency of surgical assistance varied by type of surgery, decreasing for half of the procedure groups and increasing for the remainder (tables 4-2 and 4-3). The two procedure groups with the largest proportionate increase in assistance were aortic/mitral valve replacement and knee arthroscopy. Our claims-based analysis, of course, was unable to examine whether observed changes in the frequency of assistance at surgery were appropriate (reflecting case complexity, severity, surgical risk, and so forth).

Several options exist to reduce inappropriate use of assistant surgeons. One approach has already been used by HCFA: effective January 1991, Medicare will not pay for assistant surgeons in surgical procedures which, on a national basis, employ assistants in less than 5 percent of cases [Soc. Sec. Act 1862(a)(15)(B)]. This approach assumes that claims data reflect a consensus of opinion regarding the need for assistance. A more difficult and costly approach would be to develop explicit guidelines for the appropriateness of assistance for specific surgical procedures, such as those with high rates of assistance or those with high variation in assistance rates.

A third option would be to discourage inappropriate use of assistance by instructing carriers to reduce payments to the primary surgeon in cases with paid Medicare claims for assistant surgeons. Since assistant surgeons are more likely to be used in more difficult cases and in cases with increased surgical risk (for example, in patients over age 85), it is reasonable to assume that the total work performed in such cases is increased. One would therefore not want to reduce payment to the primary surgeon by an amount comparable to the work performed by the assistant surgeon (by regulation, estimated at 16 percent of the work value of the full surgical procedure), but rather by some fraction thereof (e.g., 4 percent of the work value). Such a plan would undoubtedly be controversial, however, since primary surgeons in teaching hospitals could benefit from the use of assistants (surgical residents and fellows) without experiencing payment reductions.

Effective implementation of all three options outlined above requires that claims for assistant surgeons be easily distinguished by carriers. However, it is clear that many such claims are not readily identifiable because they lack appropriate modifiers and type of service codes. HCFA should evaluate the methods used by carriers to identify assistant surgeons' claims and improve those methods if necessary. Such an evaluation should focus on groups of procedure codes, rather than individual codes, so as to include episodes with multiple claims for distinct but closely related procedure codes, and should analyze the frequency with which the assistant surgery type of service code (8) and modifiers for assistant surgeons, co-surgeons, surgical teams, and physicians' assistants used as assistants at surgery (80, 81, 82, 62, 66, and AS) are used in single-day episodes of surgery containing more than one claim with similar procedure codes. The analysis should also make use of unique physician

identifier numbers (UPINs) to distinguish between assistant surgeon claims and multiple claims for distinct but closely related procedures by the same surgeon.

In our own analysis, we assumed that the surgical claim with the highest submitted charge represented the primary surgeon, and that other claims were from assistant surgeons; we did not rely exclusively on modifiers and type of service codes to identify assistant surgeons (see Section 3.1). Cursory analysis of such coding for our 1989 claims, however, indicates that, overall, 89 percent of claims for assistant surgeons contained the appropriate type of service, but coding accuracy for type of service varied widely across procedure groups, from 42 to 96 percent. However, only 51 percent of all assistant surgeon claims contained appropriate modifiers. Accuracy of coding for type of service and modifiers may vary substantially across carriers.

1.3.2 Procedures Performed Outside the Global Package

In both 1986 and 1989, total allowed charges for procedures "unbundled" from global packages amounted to less than one percent (\$30.2 million in 1989) of payments to primary surgeons. Despite the relatively low dollar amount, reimbursement for such procedures increased by 43 percent during this period, or nearly 13 percent annually. HCFA's recent creation of a national "global surgery" policy should control such growth. However, Medicare carriers may need to strengthen their claims processing edits to detect unbundled procedures and services performed by physicians other than the primary surgeon. This task may be made easier if carriers have combinations of procedure codes to watch for. For example, Appendix B of our report lists, for each group of primary procedures, the procedure codes which were most frequently unbundled from the global package and billed separately. These tables show, for example, that insertion of a temporary pacemaker (procedure code 33210) is one of the procedures most frequently "unbundled" from the global package for CABG surgery. Each of these tables, however, reflects the opinion of a single consultant regarding the definition of a global package for a specific primary procedure. Guidelines presented to carriers for monitoring unbundling should be based on the consensus of a group of experts who determine which high-volume procedures are properly regarded as part of a specific global package.

1.3.3 Procedures Performed Through the Same Surgical Incision

Between 1986 and 1989, total allowed charges for same-incision procedures increased by 77 percent, and in 1989 amounted to 2.3 percent (\$75.9) million of allowed charges for primary surgeons. Note, however, that these figures represent reimbursement for the full procedures, whereas the policy issue at hand is the amount of work overlap that occurs when two procedures are performed through the same incision, namely, the work of creating or closing the surgical incision. For most procedures, such work represents a small fraction of total work, perhaps 10 percent or less. Even if HCFA were to attempt to quantify the amount of work overlap for various combinations of same-incision surgery and then to reduce payment for both procedures to adjust for the overlap, the estimated potential savings (likely to be less than \$7.6 million annually) do not seem worth the research and administrative effort required from HCFA and its carriers, or the ill will that would surely be generated by the policy among surgeons.

2.0 METHODS

2.1 Study Period and Data Sources

Physician claims for surgical procedures for this study were obtained for a 5 percent national sample of Medicare beneficiaries (BMAD files) for calendar years 1986 and 1989. Analyses were performed separately on data for each year, and results are presented by year.

Demographic data for beneficiaries in the 1986 sample were obtained from the 1986 HISKEW (Health Insurance Skeleton Eligibility Write-off) files provided by HCFA, and then merged by us with surgical claims. For the 1989 sample, demographic data were included on HCFA's BMAD file.

The 5 percent MEDPAR files for 1986 and 1989 were used to obtain hospital identifiers for hospitals in which surgery occurred. The American Hospital Association's Annual Survey of Hospitals for 1986 and 1989 provided data on the characteristics of these hospitals.

Relative work values (RVUs) for surgical procedures were obtained from the Physician Services Public Use File constructed by HCFA. These RVUs were then merged with surgical claims.

2.2 Sample Selection

The purpose of this project was to analyze episodes of surgery in which physicians might reduce their workloads relative to reimbursement through sharing or unbundling services. We therefore wanted to analyze only major surgical procedures in which opportunities for work-sharing are greater. Our method for selecting surgical procedures for this study was as follows. First, we obtained from HCFA a list of the top 200 CPT procedure codes, ranked by total Medicare-allowed charges in the 1988 BMAD file. We then eliminated all codes for minor surgery and non-surgical procedures from this list. The remaining CPT codes for major surgical procedures were placed into one of 33 different "procedure groups," based on the nature of the surgery. Finally, each of these 33 groups was enlarged to include all similar CPT codes, regardless of whether they were on HCFA's original list of 200 high-cost codes.

For example, only four out of nine CPT codes for coronary artery bypass graft (CABG) surgery were included in HCFA's "top 200" list, based on total allowed charges. These four codes were placed together in a CABG procedure group. However, since the opportunity for work sharing (e.g., through use of assistants and unbundling of global services) is similar for all types of CABG surgery, we expanded the CABG group to include all nine CPT codes.

Our 33 procedure groups, and the CPT codes included in each (98 CPT codes in all), are shown in Table 2-1. These 98 CPT codes defined the surgical procedures to be analyzed in this study.

2.3 File Construction

2.3.1 Identification of Index and Secondary Surgical Procedures

We identified all paid Medicare physician claims containing one of these 98 sample-defining surgical procedure codes in the 1986 and 1989 5 percent BMAD beneficiary files. The HICNOs and dates of service for each of these claims were used to define episodes of surgery. Since we wanted to obtain all surgical claims for each of these episodes, we re-abstracted the 1986 and 1989 BMAD beneficiary files to obtain all surgical claims (whether for major or minor procedures) matching the HICNOs and dates of service for sample-defining procedure claims.

All surgical claims with the same HICNO and date of service were considered to have occurred during a single "episode of surgery." It is clear that this definition includes procedures performed both in the operating room and in other settings (such as an ICU, recovery room, cardiac catheterization lab, or at bedside), as well as some cases involving return trips to the operating room. However, claims data do not permit such fine distinctions in location of service, and these distinctions are rarely important in the analysis of work-sharing for surgical services, which are usually billed globally.

Claims from the first and second BMAD abstractions were pooled. The claims were cleaned in the following manner. All Medicare beneficiaries with end-stage renal disease were resampled, to reduce the original 100 percent sample of ESRD beneficiaries to 5 percent. Next, we dropped all claims for beneficiaries not living in one of the 50 states or the District of Columbia. Third, all claims for anesthesiology (identified by type of service and/or specialty) were dropped from the file, since we were interested only in work sharing among surgeons. Only claims for primary surgeons and assistant surgeons (types of service '2' and '8') were retained.

The cleaned claims were then sorted by HICNO, date of service, and allowed charge. Thus, within each episode of surgery, the claim with the highest Medicare-allowed charge was considered to be the claim for the "index" procedure (i.e., the primary surgeon's claim for the principal surgical procedure performed on that day), with the restriction that claims for assistant surgeons (identified by type of service or modifier) and claims for only pre- or post-operative management could not be index procedures.

To summarize, each of our two analytic files (for 1986 and 1989 data) contained episode-of-surgery-level records, with each episode defined by a HICNO and date of service. Each episode-level record contained:

- demographic data associated with the HICNO (age, sex, race, county and zip code of residence);
- an index procedure, defined as the claim with the highest Medicare-allowed charge, after excluding services identified as anesthesiology, assistance at surgery, or pre- or- post-operative management only; and
- a variable number of additional surgical claims (referred to hereafter as "secondary" procedures), which may have been for assistance at surgery or for additional major or minor surgical procedures. (Anesthesia claims were not included as index or secondary claims.)

2.3.2 Merging Hospital Characteristics

To obtain the characteristics of hospitals in which these episodes of surgery occurred, we matched our list of unique HICNO-date of service combinations against the 5 percent MEDPAR files for 1986 and 1989. The hospital ID number was taken from matching Part A

(inpatient hospital) claims and merged with appropriate episode-level records. We then matched these hospital ID numbers against the American Hospital Association's Annual Survey of Hospitals for 1986 and 1989 to obtain data on teaching status, bedsize, and type of ownership. These data were likewise merged to the episode-level records.

2.3.3 Merging Relative Work Values

The work performed by surgeons can be valued in at least two ways: by the amount of money reimbursed for the service under the customary, prevailing, and reasonable reimbursement system, and by the estimated work value of a procedure under Medicare's relative value system. This analysis uses both measures of work. Medicare-allowed charge data were already present on the claims. To obtain relative work values, we used the Physician Services Public Use File provided by HCFA. Each procedure code-modifier combination for index and secondary claims was matched against the HCFA file, and the appropriate work value was merged to each claim on the episode-level file.

Only the relative value units for work were used in this analysis. Relative value units for practice costs and malpractice, as well as all geographic adjustors, were not included. Consistent with final rules for implementing Medicare's relative-value-based fee schedule, the work value for assistance at surgery was calculated to be 16 percent of the work value of the unmodified procedure.

TABLE 2-1
PROCEDURE GROUPS FOR INDEX PROCEDURES, WITH CONSTITUENT PROCEDURE CODES

Group 1 - Mastectomy

- 19200 mastectomy, radical, including pectoral muscles, axillary lymph nodes
- 19220 mastectomy, radical, including pectoral muscles, axillary and internal mammary lymph nodes
- 19240 mastectomy, modified radical

Group 2 - Hip replacement

- 27125 partial hip replacement
- 27126 cup
- 27127 cup with acetabuloplasty
- 27130 total hip replacement
- 27132 conversion of previous hip surgery to total hip replacement
- 27134 revision of total hip arthroplasty, both components

Group 3 - Repair of femoral fracture

- 27235 repair of closed or open femoral fracture, proximal end, pinning
- 27236 open repair of closed or open femoral fracture, proximal end, internal fixation or prosthetic
- 27244 open repair of closed or open femoral fracture, trochanteric area, Internal fixation
- 27248 open repair of closed or open greater trochanteric fracture, w/o internal or external skeletal fixation

Group 4 - Knee arthroplasty

- 27446 arthroplasty, knee, condyle and plateau; medial OR lateral compartment
- 27447 arthroplasty, medial AND lateral, w/o patella ("total knee")

Group 5 – Amputation, thigh or lower leg

27590 amputation, thigh, through femur, any level
immediate fitting technique including first cast
27591 open, circular (guillotine)
27592 amputation leg, through tibia and fibula
27880 Immediate fitting technique Including first cast
27881 open, circular (guillotine)

Group 6 – Knee arthroscopy

29880 arthroscopy with meniscectomy (medial AND lateral)
29881 with meniscectomy (medial OR lateral)
29882 with meniscus repair (medial OR lateral)
29883 with meniscus repair (medial AND lateral)

Group 7 – Lung lobectomy

32480 lobectomy of lung, total or segmental
32485 with bronchoplasty
32490 with concomitant decortication

Group 8 – Permanent pacemaker insertion

33206 insertion of permanent pacemaker with transvenous electrodes, atrial
33207 Insertion of permanent pacemaker with transvenous electrodes, ventricular
33208 Insertion of permanent pacemaker with transvenous electrodes, AV sequential

Group 9 – Aortic or mitral valve replacement

33405 replacement, aortic valve, with cardiopulmonary bypass
33411 with aortic annulus enlargement, noncoronary cusp
33412 with transventricular aortic annulus enlargement (Konno procedure)
33430 replacement, mitral valve, with cardiopulmonary bypass

Group 10 - Coronary artery bypass graft (CABG) surgery

- 33510 CABG, autogenous, single graft
- 33511 CABG, autogenous, two grafts
- 33512 CABG, autogenous, three grafts
- 33513 CABG, autogenous, four grafts
- 33514 CABG, autogenous, five grafts
- 33516 CABG, autogenous, six or more grafts
- 33520 CABG, nonautogenous, single graft
- 33525 CABG, nonautogenous, two grafts
- 33528 CABG, nonautogenous, three or more graft

Group 11 - Embolectomy, femoropopliteal

- 34201 arterial embolectomy or thrombectomy, femoropopliteal, aortiliac, leg incision

Group 12 - Repair of abdominal aneurysm

- 35081 repair or excision of aneurysm, abdominal aorta
- 35082 repair of ruptured aneurysm, abdominal aorta
- 35091 repair or excision of aneurysm, abdominal aorta involving visceral organs
- 35092 repair of ruptured aneurysm, abdominal aorta involving visceral organs
- 35102 repair or excision of aneurysm, abdominal aorta involving iliac vessels
- 35103 repair of ruptured aneurysm, abdominal aorta involving iliac vessels

Group 13 - Carotid endarterectomy

- 35301 thromboendarterectomy, carotid, vertebral, subclavian

Group 14 - Bypass graft, leg

- 35556 bypass graft, vein, femoropopliteal
- 35566 bypass graft, vein, femoral, anterior tibial, posterior tibial or peroneal
- 35646 bypass graft with other than vein, aortofemoral or bifemoral
- 35656 bypass graft with other than vein, femoropopliteal

Group 15 - Cholecystectomy

47600 cholecystectomy
47605 cholecystectomy with cholangiography
47610 cholecystectomy with exploration of common bile duct

Group 16 - Exploratory laparotomy

49000 exploratory laparotomy, celiotomy, w/wo biopsy

Group 17 - Inguinal hernia repair

49505 repair inguinal hernia, age 5 or over
49520 repair inguinal hernia, any age; recurrent
49525 sliding
49530 incarcerated
49535 strangulated

Group 18 - Ventral hernia repair

49560 repair ventral hernia
49565 recurrent

Group 19 - Renal transplantation

50360 renal homotransplantation, implantation of graft; excluding donor and recipient nephrectomy
50365 with unilateral recipient nephrectomy
50366 with bilateral recipient nephrectomy

Group 20 - Transurethral prostatectomy

52601 TURP, incl. control of postop bleeding

Group 21 - Total hysterectomy

58150 total hysterectomy
58152 with colpo-urethrocystopexy (Marshall-Marchetti-Krantz type)

Group 22 - Vaginal hysterectomy

58260 vaginal hysterectomy
58265 vaginal hysterectomy with plastic repair of vagina
58267 with colpo-urethrocystopexy (Marshall-Marchetti-Krantz type, etc.)

Group 23 - Laminectomy

63005 laminectomy for exploration/decompression of spinal cord and/or cauda equina
63017 laminectomy, two or more segments, lumbar

Group 24 - Laminotomy

63030 Laminotomy (hemilaminectomy), one interspace, lumbar, unilateral
63031 laminotomy (bilateral laminectomy), one interspace, lumbar, bilateral
63042 Laminotomy (hemilaminectomy), re-exploration, lumbar

Group 25 - Carpal Tunnel Repair

64721 neuroplasty, median nerve at carpal tunnel

Group 26 - Cataract extraction

66983 intracapsular cataract extractio with insertion of intraocular lens prosthesis
66984 extracapsular cataract removal with intraocular lens insertion

Group 27 - Intraocular lens insertion

66985 insertion of intraocular lens subsequent to cataract removal

Group 28 - Percutaneous transluminal coronary angioplasty (PTCA)

92982 PTCA, single vessel
92984 each additional vessel

Group 29 - Suprapubic prostatectomy

55821 prostatectomy; suprapubic, subtotal, one or two stages

Group 30 - Dilatation and curettage (D & C) of Uterus

58120 Dilatation and curettage, diagnostic and/or therapeutic (nonobstetrical)

Group 31 - Enterolysis

44005 enterolysis for acute bowel obstruction

Group 32 - Enterectomy

44120 enterectomy, resection of small intestine, with anastomosis

Group 33 - Colectomy

44140 colectomy, partial; with anastomosis
44141 colectomy with skin level colostomy or colostomy
44143 colectomy, partial, with end colostomy & closure of distal segment
44144 colectomy with resection, with colostomy or ileostomy and creation of mucostomy
44145 colectomy, partial, with coloprostostomy
44146 colectomy, partial; with coloproctoscopy (low pelvic anastomosis), with colostomy
44147 colectomy, partial; abdominal and transanal approach

Source: CPT: Physicians' Current Procedural Terminology. Chicago:
American Medical Association, 1985 through 1990 editions.

3.0 ANALYTIC METHODS

3.1 Identification of Assistant Surgeons

Within each episode of surgery, we needed to identify all claims for assistant surgeons. Theoretically, all such claims should contain appropriate type of service and modifier codes marking the billed services as assistance at surgery. However, our experience in claims analysis has shown that assistant surgeons do not reliably use such coding. Therefore, although we used type of service and modifier codes when present, we also considered other claims to be for assistance at surgery under certain circumstances: when one or more secondary claims within a single episode of surgery were in the same procedure group (e.g., CABG) as the index procedure, these secondary claims were considered to be for surgical assistance. This assumption was made whether or not the additional claims had the same provider number as the index procedure, since Medicare provider numbers may cover multi-physician groups.

3.2 Use of Physician Consultants to Clarify Billing Issues

In addition to identifying claims for assistance at surgery, we also needed to know how to classify other secondary procedures for the purposes of analyzing work-sharing. For each of the 33 procedure groups in this analysis, we therefore obtained frequencies of procedure codes for secondary claims for both the 1986 and 1989 analytic files. Codes which accounted for one percent or more of secondary claims in either year were included in lists of procedures to be evaluated by our physician consultants. Codes which did not meet this one percent criterion for either year were dropped from further analysis. A separate list of procedures was developed for each of the 33 groups.

In evaluating secondary procedures, consultants were asked to assume that the secondary procedure is performed on the same day as the index procedure. They were then asked to tell us whether, under these circumstances:

- the secondary procedure is usually considered part of the global package of services reimbursed under the index procedure;
- the secondary procedure is usually performed through the same incision as the index procedure; and
- the secondary procedure is usually therapeutic rather than diagnostic.

Although we had already excluded anesthesia claims based on type of service and specialty, our list of frequently performed secondary procedures nevertheless included some services (e.g., administration of spinal anesthesia) which are likely to be performed usually or exclusively by anesthesiologists. We assumed that some anesthesiology claims might not have been identifiable by type of service and specialty. We therefore also asked our consultants which (if any) of the secondary procedures on our lists were usually performed by anesthesiologists in their institutions.

To illustrate the task requested of our consultants, a sample list of secondary procedures for one of the 33 groups of index procedures is shown in Appendix A, along with a copy of the instructions sent to all of our consultants.

Our consultants were chosen on the basis of recommendations from health policy researchers in several cities. All consultants are practising surgeons; some are engaged in health policy and other research, as well. All are affiliated with medical schools and teaching hospitals, although some maintain private practices and perform surgery principally in community hospitals. The surgical specialties of our consultants are shown for each procedure group in Table 3-1.

After receiving the responses of our surgical consultants, we labelled each secondary procedure in each episode of surgery according to whether it was usually billed as part of the global package for the index procedure, whether it was usually performed through the same incision as the index procedure, and whether it was usually a therapeutic procedure. Secondary procedures were dropped from further analysis if our surgical consultants said they were usually performed by anesthesiologists.

TABLE 3-1
LIST OF SURGICAL SPECIALTIES OF CONSULTANTS, BY INDEX
PROCEDURE GROUP

<u>Index Procedure Group</u>	<u>Surgical Specialty</u>
1 Mastectomy	General surgery
2 Hip replacement, partial or total	Orthopedics
3 Repair of femoral fracture	Orthopedics
4 Knee arthroplasty (replacement)	Orthopedics
5 Amputation, thigh or lower leg	General surgery
6 Knee arthroscopy	Orthopedics
7 Lung lobectomy	Thoracic surgery
8 Permanent pacemaker insertion	Invasive cardiology
9 Aortic or mitral valve replacement	Thoracic surgery
10 Coronary artery bypass surgery	Thoracic surgery
11 Arterial embolectomy, femoropopliteal	General surgery
12 Repair of abdominal aneurysm	General surgery
13 Carotid endarterectomy	General surgery
14 Bypass graft, leg	General surgery
15 Cholecystectomy	General surgery
16 Exploratory laparatomy	General surgery
17 Inguinal hernia repair	General surgery
18 Ventral hernia repair	General surgery
19 Renal transplantation	Renal transplant service
20 Transurethral prostatectomy	Urology
21 Total hysterectomy	GYN
22 Vaginal hysterectomy	GYN
23 Laminectomy	Neurosurgery
24 Laminotomy	Neurosurgery
25 Carpal tunnel repair	Orthopedics
26 Cataract extraction with lens insertion	Ophthalmology
27 Lens insertion subsequent to cataract extraction	Ophthalmology
28 Percutaneous transluminal coronary angioplasty	Invasive cardiology
29 Suprapubic prostatectomy	Urology
30 D & C of uterus	GYN
31 Enterolysis	General surgery
32 Enterectomy	General surgery
33 Colectomy	General surgery

4.0 RESULTS

This study investigated three possible ways in which surgical procedures may deviate from the single-physician, single-bill assumptions underlying the resource-based relative value scale: (1) the use of assistant surgeons may benefit the primary surgeon by reducing the work required of him without reducing his reimbursement; (2) two surgeons may perform different procedures through the same incision; and (3) surgeons may unbundle services covered by a single global fee and bill the services separately. Unbundled services may be performed by the primary surgeon, an assistant surgeon, or by a different surgeon.

The findings presented in this section show, for each index procedure, claims data for primary surgeon claims compared to data for "secondary" claims billed the same day as the index procedure. We defined secondary claims as either procedures performed by assistant surgeons, procedures that are usually billed within a global package, or procedures performed through the same incision as the index procedure. We excluded claims by anesthesiologists.

In order to better understand the program costs of deviations from the single-physician, single-bill reimbursement model, national estimates are presented for each index procedure separately as well as for all index procedures combined (i.e., overall mean allowed charges for our "sample" of surgical procedures). From here on, any discussion of allowed charges or frequency of claims is limited to the 33 index procedures or a subset of those procedures, unless otherwise noted. Tables in this chapter generally show data for both 1986 and 1989. Because differences between years are small, changes from 1986 to 1989 are not emphasized.

4.1 Growth in Medicare Spending for Primary Surgeons' Claims

Medicare allowed primary surgeon charges for the 33 index procedures examined in this study totalled \$3.3 billion in 1986 and \$3.9 billion in 1989, an increase of 18.8 percent over the three years. For comparison, total federal expenditures on physicians' services were \$21.8 billion in 1986 and \$31.8 billion in 1989, a growth of 46 percent in three years. In 1989,

primary surgeon allowed charges for the 33 index procedures amounted to roughly 10 percent of all federal expenditures for physicians' services.*

Growth in primary surgeon allowed charges for the index procedures was due to increases in both volume and price per unit of service. There were a total of 114,343 "episodes" of surgery for all of the index procedures in 1986, rising to 130,472 in 1989 -- a growth in volume of 14.1 percent (Table 4-1). The mean price per episode, defined as the average allowed charge for primary surgeon services per episode of surgery, grew from \$1,444 in 1986 to \$1,503 in 1989, an increase of 4.1 percent (Table 4-1). In contrast, the case mix of surgical procedures increased in complexity between 1986 and 1989, from a mean of 12.3 relative value units for work per procedure (primary surgeon only) to 13.3 RVUs in 1989, an increase of 8.1 percent.

4.2 Assistance at Surgery

Performing procedures with the assistance of another surgeon is one of the ways surgeons can deviate from the single-physician single-bill model. Because of the limitations of Medicare claims as research data, our definition of assistant surgeons includes not only the assistants, but also: (1) co-surgeons; (2) similar or repeat procedures performed on the same day by the primary surgeon; (3) incorrectly billed procedures; and (4) anesthesia claims which were billed by multi-specialty groups and were therefore not identifiable as anesthesia claims. (The last three categories reflect the lack of precision in some claims elements, together with a low level of error.) From here on, all of these categories will be included in the "assistant surgeon."

For the 33 index procedures, total Medicare allowed charges for assistant surgeons were \$208.6 million in 1986 and \$256.8 million in 1989, rising more rapidly than allowed charges for primary surgeons (23.1 percent compared to 18.8 percent, respectively) (Tables 4-2 and 4-3). Total allowed charges for assistant surgeons were just over 6 percent of total

*Lazenby, J.C., and S.W. Letsch, "National Health Expenditures, 1989," Health Care Financing Review, 12:1-26 (Winter 1990).

allowed charges for primary surgeons in both years. Growth in total allowed charges for assistant surgeons can be decomposed into four components: volume, price, intensity and casemix.

The volume of assistant surgery can increase as (1) the number of episodes of surgery increases, and (2) the percentage of episodes with an assistant surgeon claim increases. We have already shown that the total number of episodes has increased 14 percent between 1986 and 1989. However, the percent of cases with assistance at surgery declined slightly over the time period, from 23.5 percent in 1986 to 22.6 percent in 1989 (Tables 4-2 and 4-3).* The 8.1 percent increase in surgical complexity between 1986 and 1989 (as measured by mean work RVUs per procedure) indicates that factors other than case mix were responsible for this decrease in the use of assistant surgeons.

The price for an assistant surgeon claim, measured as the average Medicare allowed charge for an assistant surgeon claim, was \$354 in 1986 and \$388 in 1989, an increase of 9.6 percent between the two years. Since the average allowed charge per assistant surgeon claim reflects a somewhat different mix of procedures from year to year, comparisons between 1986 and 1989 should be made with caution. In 1986, the mean allowed charge for an assistant surgeon claim was 24.5 percent of the mean allowed charge for the primary surgeon claim, rising to 25.8 percent in 1989.

We analyzed the data to allow for the possibility that cases may have more than one assistant surgeon claim on the same day as the primary surgeon claim (a measure of "intensity" of assistance at surgery). While there were some cases where this was true, they were not common. In the vast majority of cases with any assistant surgeon claims, only one such claim was present. Overall, in 1986 there were an average of 1.10 assistant surgeon claims per case where there was any assistant surgeon claim; this number increased slightly to 1.12 in 1989. There was little variation across procedures: the low was TURP (1.02) and the high was laminotomy (1.56) (Refer to Table 4-4). From here on, we define rates of assistance at surgery as the number of cases with at least one assistant surgeon divided by the total

*At the claims (rather than the episode) level, claims for assistance at surgery amounted to 25.8 percent of claims for primary surgeons in 1986, decreasing to 25.4 percent in 1989.

number of cases. That is, the rate of assistance at surgery will be defined as the number of cases with an assistant surgeon claim divided by the total number of cases.

4.2.1 Variation in Assistant Surgery Rates

Since there were few striking changes from 1986 to 1989 in surgical assistance rates by index procedure, this section will present results only from 1989. Wherever notable differences between the two years exist, the differences will be discussed.

Frequency of Assistance at Surgery

Use of surgical assistants varied by type of primary procedure. In order to more easily discuss variations across procedures, the 33 index procedures were divided into three groups representing different ranges of rates of assistance at surgery. Based on 1989 assistance at surgery rates (Table 4-3), procedures were separated into three groups: high, medium, and low. The "low" group was defined as having rates between zero and 10 percent, the "medium" group between 11 and 33 percent, and the "high" group defined as rates over 33 percent. These divisions are somewhat arbitrary; that is, divisions were made where the data appeared to break naturally or at obvious break points in the data. Many of the procedures in the "high" group had rates of assistance at surgery in excess of twice the mean overall rate of 22.6 percent. It is important to note that our classification is for discussion purposes only; we cannot determine from our analysis whether rates are high or low in an absolute sense, or whether high rates of assistance at surgery are appropriate or inappropriate.

Six procedures were classified as having "low" rates of assistance at surgery (Table 4-5). The lowest of these were D & C of the uterus and TURP (0.5 and 0.7 percent, respectively), while the highest (in the low group) was intraocular lens insertion (9.8 percent). One generalization that can be made about these procedures with relatively low rates of assistance at surgery is that they all involve very small surgical fields (e.g., cataract extraction) and/or limited access to the surgical field (e.g., TURP, D&C).

The group classified as having "medium" rates of assistance at surgery consisted of a wide range of procedures. At the low end of the "medium" group was knee arthroscopy which is an endoscopic procedure. Other procedures in the "medium" group ranged from complex procedures such as renal transplantation (17.9 percent) to ventral hernia repair (31.4 percent) (Table 4-5). It may seem surprising that renal transplantation would have a lower rate of assistance at surgery than a ventral hernia repair. It is likely that factors other than the nature of the surgical procedure are driving some of variation within the "medium" group, and between the high, medium, and low groups as well. Reasons for such variation in assistance at surgery will be discussed in the next section.

Eighteen procedures were classified as having relatively "high" rates of assistance at surgery (Table 4-5). The procedure with the lowest rate within the "high" group was laminectomy (36.6 percent) while the highest rate was for aortic or mitral valve replacement (69 percent). CABG surgery (67.6 percent) and aortic or mitral valve replacement have substantially higher rates of assistance at surgery than the next highest procedure -- repair of abdominal aneurysm. There were only small changes in rates between 1986 and 1989 for the "high" group.

Reimbursement for Assistance at Surgery

Medicare-allowed charges for assistant surgeon claims also varied by the primary surgical procedure. There are three different ways of expressing allowed charges for assistants at surgery: (1) mean charge per case for assistant surgeon claims; (2) mean charge per case for assistant surgeon claims, as a percent of mean charge per case for the primary surgeon claim; and (3) total charges for assistant surgeon claims, as a percent of total charges for primary surgeon claims. This discussion will focus primarily on measures expressed as percentages of primary surgeon charges (methods 2 and 3 above).

Mean allowed charges for assistant surgeon claims as a percent of mean allow charges for primary surgeon claims (method 2) has been regulated by the Medicare program since 1982. The Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982 restricted payment for assistant surgeon claims to 20 percent of the primary surgeon allowed charge. Therefore, little variation between procedures is expected. Overall, 1989 mean allowed charges per assistant surgeon claim across all groups were 25.8 percent of mean allowed charges for the primary

surgeon claim (Table 4-3). One reason this exceeds 20 percent is that our definition of assistants at surgery is broader than the definition used to enforce the 20 percent limit and includes some degree of error.*

Interestingly, the group of procedures classified as having relatively high rates of assistance at surgery, such as aortic or mitral valve replacement and CABG surgery, were also procedures with a lower than average mean allowed charge for assistant surgeon claims (as a percent of mean allow charge for the primary surgeon claim).

The most variation was within the group of procedures classified as having "low" rates of assistance at surgery. Pacemaker insertion, carpal tunnel repair, and D & C of the uterus are examples of procedures with very few but relatively expensive assistant surgeon claims. For example, in the case of D & C of the uterus, allowed charges for the few assistant surgeon claims (found in only 0.5 percent of cases) amounted to 64 percent of the primary surgeon claim in 1989. Given the very low incidence of assistance at surgery, this finding is most likely attributable to the influence of a small number of ambiguous claims (e.g., repeat procedures and improperly coded anesthesia claims) with higher allowed charges; that is, the influence of error is higher in procedure groups where assistants are used infrequently.

Method three (total allowed charges for assistant surgeons as a percent of total allowed charges for primary surgeons) differs from method two in that it takes into account both the frequency of assistance at surgery and the price per assistant surgeon claim. For all cases (and all procedures), allowed charges for assistant surgeon claims summed to 6.5 percent of allowed charges for primary surgeon claims (Table 4-3). There was considerable variation between procedures. Total assistant surgeon charges for cataract extraction and TURP (both high volume procedures) were very low relative to total primary surgeon allowed charges for those procedures (1.6 percent and 0.2 percent, respectively). At the other extreme, total allowed charges for assistance during aortic or mitral valve replacement and CABG surgery amounted to 18 and 15 percent (respectively) of total allowed charges for primary surgeon claims for those procedures.

*In order for carriers to enforce the 20 percent limit, assistant surgeons must be identified by either a type of service code equal to '8' or CPT-4 modifiers equal to '80,' '81,' or '82.' It appears clear that many assistant surgeons' claims are not so identified.

Which of the index procedures cost the Medicare program the most in terms of assistant surgeon outlays? The rightmost column of Table 4-3 shows the total allowed charges for assistant surgeons as a percent of allowed charges for the primary surgeon. For 13 procedures, this figure exceeded 10 percent in 1989. With one exception (knee arthroscopy), all of these procedures have "high" rates of assistance at surgery. That is, procedures with high rates of assistance are also procedures for which total payments to assistant surgeons exceed 10 percent of payments to the primary surgeon.

4.2.2 Reasons for Variation in Rates of Assistance at Surgery

There are several reasons why rates of assistance at surgery may vary by type of primary surgery. Rates may be influenced by the type of institution where the surgery was performed. For example, a teaching hospital is more likely to involve residents in assisting during surgery. Residents do not bill Medicare for their services; therefore a teaching hospital is likely to have lower rates of assistance at surgery (based on claims, as we have defined assistant surgery for this study). Variation may also be observed according to hospital size, although this may capture teaching status as well.

The specialty of the primary surgeon may also be an important factor. Some specialties may be more likely to request the services of an assistant surgeon. Another factor is the nature of the surgery. Although it is very difficult to accurately measure such things as work intensity, surgical field size, incision size, the "number of hands" required for a surgical procedure, or the riskiness of a procedure, these are all procedure characteristics that may influence the use of an assistant surgeon. Characteristics of the patient (such as medical history, severity, and surgical risk) may also affect the rate of assistance at surgery. Finally, government regulations that restrict assistant surgeon billing for some procedures and not others can cause variation in rates between procedures. (For example, the Consolidated Omnibus Reconciliation Act of 1985 prohibited Medicare reimbursement for assistants at surgery for cataract extractions and lens insertions without prior approval by the appropriate peer review organization. This prohibition took effect on March 1, 1986, and very likely explains the drop in the rate of surgical assistance during cataract extraction, from 9.8 percent of cases in 1986 to 6.3 percent in 1989. Likewise, the rate of assistance during intra-ocular lens insertion dropped from 13.2 percent in 1986 to 9.8 percent in 1989.)

In order to investigate some of these potential determinants, assistant surgery rates were calculated for several hospital characteristics, such as bed size, ownership, and teaching status. Additionally, rates were calculated according to the specialty of the primary surgeon. Rates were also calculated for selected patient characteristics, such as age, sex, race, and census division. Those rates that were calculated across all procedures were adjusted for case mix, with the exception of rates by specialty. (It was not necessary to case-mix adjust rates by specialty, as specialty is already highly correlated with case-mix.)

Characteristics of the institution where the surgery was performed are some of the more influential determinants of variation in assistance at surgery (Table 4-6). Small hospitals have higher rates of assistance at surgery than other hospital classes. Hospitals with less than 100 beds had an overall assistance rate of 45 percent in 1989. With each larger bed size category, the rate dropped, with the largest hospitals (500+ beds) having the lowest overall rate of assistance at surgery, 19.5 percent.

Rates varied by hospital ownership as well. Private, for-profit hospitals had the highest rates of assistance at surgery -- 42.9 percent. Not-for-profit hospitals, both public and private, had rates close to the overall average, approximately 34 percent.* Private for-profit hospitals are more likely to be small, therefore it is difficult to determine which effect is greater -- hospital ownership or bedsize.

Rates of assistance at surgery also vary according to whether the surgery was performed in a teaching hospital. Such variation is expected because, since 1982, the Medicare program has enforced restrictions on payment for assistants at surgery in teaching hospitals. Generally, no payment may be made for assistant surgeons in teaching hospitals. There are four exceptions: (1) the teaching hospital does not have a training program related to the medical specialty related to the procedure; (2) a resident is not available; (3) an emergency, life-threatening situation warrants immediate attention; and (4) where a team of surgeons is required (e.g., CABG surgery) and each surgeon performs a separate task (as opposed to assisting the primary surgeon). Team members are permitted to bill as assistant surgeons.

*The overall average rate of assistance at surgery is different for "facility characteristics" because it was not possible to merge facility-level data to all episodes of care. The overall average for cases where facility-level data were merged is slightly higher than the overall average reported earlier.

Teaching hospitals (which are typically larger hospitals) had an average rate of assistance at surgery of 23.6 percent, compared to 43.9 percent for non-teaching hospitals (Table 4-6). A large part of the variation in rates of assistance at surgery among procedures is probably explained by the teaching status of the hospital where the procedure was performed. For instance, renal transplantation, which is a relatively complicated procedure, is performed more often in teaching hospitals. In 1989, 93 percent of renal transplantation cases were performed in teaching hospitals. This may partly explain its relatively medium to low rate of assistance at surgery (17.9 percent) (Table 4-5).

Many of the procedures classified as having relatively high rates of assistance at surgery were performed primarily in non-teaching hospitals. Cholecystectomy, colectomy, mastectomy, and hysterectomy may have higher rates because they are performed more frequently in non-teaching hospitals. For example, in 1989 nearly two-thirds of all cholecystectomies were performed in non-teaching hospitals. Table 4-7 shows the distribution of episodes in all 33 procedure groups by characteristics (teaching status, bedsize, and ownership) of the hospitals in which they were performed.

The specialty of the primary surgeon may also be a determinant of whether an assistant surgeon is used. Table 4-6 shows rates of assistance at surgery by the specialty of the primary surgeon. General surgeons, thoracic surgeons, and orthopedic surgeons were the most likely to have assistant surgeons helping them in the operating room (1989 rates ranged from 33.1 percent for orthopedic surgeons to 53.1 percent for thoracic surgeons). The reason for general surgeons' and thoracic surgeons' higher rates are unclear. There are two possibilities: (1) procedures performed by general surgeons (such as cholecystectomy or colectomy) may have higher rates of assistance at surgery because they are more likely to be performed in smaller, non-teaching hospitals where residents are not as available to assist in the operating room; or (2), in the case of thoracic surgeons, the nature of the procedures they perform may require more assistance (e.g., CABG and valve replacement).

In addition to provider characteristics such as hospital type and specialty of the primary surgeon, the nature of the surgery is likely to explain some of the variation across procedures. Procedures with "low" rates of assistance at surgery are perhaps the best examples of cases where the nature of the surgery may curb the use of an assistant surgeon. TURP is an endoscopic procedure. It is not surprising that endoscopic procedures have lower

rates of assistance at surgery, since an endoscope generally is operated by only one surgeon at a time.

Other procedures with "low" rates of assistance at surgery are ones performed through a small incision (or no incision) and within a small surgical field. D & C of the uterus is a relatively simple procedure which does not require an incision (it is performed entirely through the vagina). Such a procedure creates very little opportunity for surgical assistance. Carpal tunnel repair is an example of a procedure performed within a small surgical field.

Another source of variation in rates of assistance at surgery between procedures is patient mix. A patient's medical history may help determine whether a surgical assistant is necessary. If a patient has a history of complications during surgery or there is reason to believe, based on pre-operative information, that a procedure may not be "routine," a primary surgeon may be more likely to enlist the aid of a surgical assistant. It is possible that patients undergoing more complex procedures (which often have higher rates of assistance at surgery) are more likely to have medical histories that warrant the use of a surgical assistant. Older patients, who may be sicker, are more likely to have assistant surgeons in the operating room during surgery (23.8 percent for the over 85 group versus 20.6 percent for the under 65 group), after controlling for case-mix (Table 4-6).

Surprisingly, assistance at surgery rates vary by patients' race. Assistant surgeons were used in only 17 percent of cases where the patient was black, compared to 22.9 percent for whites (Table 4-6). One possible explanation of this difference is that blacks may be more likely to use public, non-profit, and/or teaching hospitals, where rates of assistance at surgery are lower.

A patient's gender did not seem to be a determinant of rates of assistance at surgery. Both males and females had rates similar to the overall average of 22.6 percent.

Where a patient is located does explain variation in assistance at surgery rates. The Pacific and Mountain census divisions have the highest rates -- 38.3 percent and 30.5 percent, respectively (Table 4-6). Rates for other census divisions were more similar to the national average. The East North Central and the East South Central had lower than average rates of assistance at surgery. It is likely that not all Medicare carriers enforce assistant surgery limits equally, which would help explain rate variation by geographic region. (Tables 4-9 and 4-10 show overall rates of assistance at surgery by carrier for 1986 and 1989.) Also, the distribution

of large teaching hospitals is not uniform by geographic region. The New England and Atlantic census divisions have a disproportionately large share of teaching hospitals.

Medicare program regulations that went into effect in January of 1991 will likely explain some of the variation in surgical assistance rates in subsequent years, although this analysis has not been affected by the new regulations. For procedures where an assistant surgeon is used in 5 percent or less of the cases nationally, the program will not pay for the service. The Medicare program has identified and listed the procedures that are affected by this rule. Among the 33 index procedures, pacemaker insertion, TURP, cataract extraction, and D & C of the uterus will be affected by the new regulations.

4.2.3 Relative Work Performed by Assistant Surgeons

Another method of assessing the impact of assistant surgeon use is to compare relative value units (RVUs) for procedures performed by an assistant surgeon to RVUs of procedures performed by the primary surgeon. Although both use the same procedure code, the RVU for a procedure performed by an assistant surgeon by law can only be 16 percent of the RVU for the primary procedure. Therefore, we would expect RVUs for assistance at surgery to be much lower than the RVU for the primary procedure. A per case RVU, comparable to a per case allowed charge, describes on average how much work is assigned to the assistant surgeon claims.

The rightmost column of Table 4-8 shows the mean relative work value in RVUs per episode for assistant surgeons, expressed as a percent of the mean work value for the index procedure (1989 data). Overall, the mean relative work value per case for assistant surgeons was 5.1 percent of the relative work value for primary surgeons. This number is a result of three factors: the proportion of surgical cases with any surgical assistance, the intensity of surgical assistance (number of assistants) per case, and the relative work value assigned to the assistant surgeon's claim. The last is an important limiting factor for all procedures: under the Medicare fee schedule, claims for surgical assistance are assigned only 16 percent of the relative work units assigned to the full procedure. However, variation across procedures in the relative work by assistant surgeons is best explained by the frequency with which assistants are used. The relative work per case provided by assistants was lowest for D & C (0.1 percent of the work of the primary surgeon), since assistants are used so infrequently

during D & C. Assistant surgeons provided a relatively greater proportion of the work for procedures like valve replacement, CABG, and repair of abdominal aneurysm, in which surgical assistants are used much more frequently.

4.3 Procedures Billed Outside of the Global Package

Another departure from the single-physician, single-bill model is the billing of related procedures outside of the global package. Physicians may unbundle services covered by a single global fee and bill services separately or request another physician to perform and bill for certain services. To the extent that other physicians perform these tasks, the work of the primary surgeon decreases while program outlays increase. This section presents the results of an analysis of global versus non-global billing of "secondary" procedures. Here, secondary procedures are those surgical services billed on the same day as the index procedure, but which are not claims for assistance at surgery. They may be performed by the primary surgeon or by a different surgeon, and they may be performed in the operating room or in another location. We asked our physician consultants to identify those secondary procedures which, in a typical setting and under typical circumstances, would be reimbursed as part of the global fee for the primary surgeon.

If a surgeon consultant stated that a procedure was, in practice, typically reimbursed as part of the global package, we analyzed the frequency and cost of such "unbundled" procedures. From this point on, for clarity, we refer to such procedures as "usually-global." In addition to identifying secondary procedures as typically included in the global package, procedures were also classified as either primarily diagnostic or therapeutic.

In 1986, total allowed charges for secondary procedures billed outside of the global package ("usually-global") were \$21.1 million, rising to \$30.2 million in 1989, an increase of 43 percent. Total allowed charges for primary surgeons grew 18.8 percent over the time period (Tables 4-11 and 4-12). Of the \$30.2 million allowed charges in 1989, \$21.3 million (71 percent) was for procedures considered primarily therapeutic and \$8.9 million (29 percent) was for procedures considered primarily diagnostic. Both therapeutic and diagnostic procedures increased at similar rates between the two years.

Allowed charges for usually-global procedures are surprisingly low relative to primary surgeon charges for the same procedures. In both years, allowed charges for procedures billed outside of the global package summed to less than one percent (0.7 percent) of allowed charges for primary surgeons.

Variation by Index Procedure

Are some index procedures more likely to have secondary procedures billed outside of the global fee package? In both years, there was little variation in allowed charges billed outside of the global package as a percent of primary surgeon allowed charges by index procedure (Tables 4-11 and 4-12). In fact, 24 of the 33 index procedures had therapeutic usually-global allowed charges between zero and one percent of the corresponding primary surgeon allowed charge. Six procedures did not have any allowed charges for secondary therapeutic procedures billed outside of the global package; they were repair of femoral fracture, repair of abdominal aneurysm, cholecystectomy, PTCA, and D & C of the uterus. Of the twelve procedures where this measure exceeded one percent, five were between one and two percent, leaving only seven procedures where non-global billing exceeded 2 percent of primary surgeon allowed charges.

The procedure with the highest percentage of therapeutic usually-global allowed charges was knee arthroscopy. In 1989, total allowed charges for usually-global secondary procedures amounted to 10.7 percent of total allowed charges for primary surgeons performing knee arthroscopy (Table 4-12). The same-day therapeutic procedure most frequently billed outside of the global package for knee arthroscopy was CPT 29877: "arthroscopy, knee, surgical; for infection, lavage, and drainage; with debridement/shaving of articular cartilage." This procedure accounted for 62 percent of all same-day therapeutic usually-global procedures for this index procedure.*

For more detailed information on same-day procedures associated with each index procedure, refer to Appendix B. Appendix B includes a separate table for each of the 33 index

*It is possible that the high frequency of "unbundling" of knee arthroscopy claims might represent bilateral knee arthroscopy on the same day; this however is unlikely to occur frequently.

procedure groups. Each table, in turn, lists all frequently-billed same-day surgical procedures (excluding those for assistant surgeons and anesthesiologists). Our surgical consultants have classified each of these "secondary" procedure codes, when performed in conjunction with the listed index procedure, as:

- primarily therapeutic or diagnostic;
- usually performed through the same surgical incision as the index procedure, or through a different incision; and
- usually considered to be part of the global package of services reimbursed under the index procedure, or usually reimbursed separately.

Consultants' classifications for each secondary procedure code are apparent from the tables in Appendix B, and a key to reading the tables is provided in the Appendix. These tables will be of use to HCFA policymakers and the researchers concerned with issues of global reimbursement for surgery.

The index procedure with the next highest percentage of same-day therapeutic usually-global procedures was renal transplantation (5.9 percent). The most frequently billed same-day procedure was CPT 50780, "ureteroneocystostomy, anastomosis of ureter to bladder, or other operations for correction of vesicoureteral reflux." This procedure accounted for 71 percent of all same-day therapeutic usually-global procedures for this index procedure.

Other index procedures with relatively high allowed charges for therapeutic usually-global procedures were intraocular lens insertion (4.9 percent of allowed charges for primary surgeon), exploratory laparotomy (3.6 percent), laminectomy (3.3 percent), enterectomy (2.5 percent), and enterolysis (2.2 percent). The remainder of index procedures had total therapeutic usually-global allowed charges less than 2 percent of the corresponding total allowed charges for the primary surgeon.

Diagnostic procedures billed outside the global package amounted to even less. In 1989, total allowed charges for usually-global diagnostic procedures did not exceed two percent for any index procedure. The highest percent of usually-global allowed charges for secondary diagnostic procedures was for mastectomy, amounting to only 2 percent of primary allowed charges. The most frequent diagnostic secondary procedure associated with mastectomy is CPT 19120, "excision of cyst, fibroadenoma, or other benign or malignant tumor, aberrant breast tissue, duct lesion or nipple lesion (except CPT 19140), male or female, one or more lesions" (Appendix B). These may be cases in which a "lumpectomy" is performed for diagnostic purposes, followed on the same day by mastectomy for malignancy.

Variation in Average Allowed Charges Per Case

Average allowed charges per case for procedures billed outside of the global package were \$9.21 in 1986 and \$11.60 in 1989 across all procedures, the majority being therapeutic procedures (Tables 4-13 and 4-14). For comparison, average allowed charges per case for secondary procedures that are not usually included in the global package were \$24.62 in 1986 and \$38.07 in 1989.

There was some variation across procedure groups in allowed charges for procedures billed outside of the global package. In 1989, knee arthroscopy and renal transplantation had mean allowed charges per case of \$118 and \$145, respectively, for therapeutic usually-global procedures, whereas the overall average (across all cases and all procedures) was only \$8 (Tables 4-13 and 4-14). For diagnostic secondary procedures, the procedures with the highest allowed charges were mastectomy, CABG, PTCA, enterectomy, and lung lobectomy. Aortic or mitral valve replacement, CABG surgery, bypass graft of the leg, and enterectomy were procedures with a high amount of charges for secondary procedures which (according to our consultants) are not usually included in the global package relative to charges for usually-global procedures.

Variation by Patient, Physician, and Facility Characteristics

The amount of billing for usually-global procedures may vary by beneficiary, physician, and facility characteristics. For example, one study has shown that Medicare

carriers have varying definitions of global packages, depending on the type of procedure.* Variation by geographic region may be due to variation in Medicare carriers' global service definitions. However, perhaps due to the low overall amount of usually-global procedures, this study shows very little variation by beneficiary, physician, and facility characteristics (Tables 4-15 and 4-16).

4.3.1 Relative Value Units of Work Performed Outside of the Global Package

Another method of assessing the degree to which procedures are billed outside of the global package is to look at the average number of relative value units (RVUs) for work, per case, for usually-global procedures. Since Medicare has moved to a relative value scale for reimbursing physicians, the average number of usually-global RVUs per case indicates what the Medicare program will have to pay under the new system.

The mean work RVU for the index procedure (primary surgeon) is calculated by summing all of the work RVUs associated with the index procedure and dividing by the total number of episodes for the index procedure. The results of this are presented on Table 4-17. The mean relative value units for secondary procedures (the sum of RVUs for usually-global secondary procedures divided by the number of episodes for the index procedure) are also shown on the table.

The mean work RVU for usually-global procedures is low compared to the mean primary procedure RVU. For therapeutic secondary procedures, the procedure with the highest mean RVU, measured as a percent of the mean primary procedure RVU, was renal transplantation (8.4 percent). The next highest was knee arthroscopy at 5.8 percent. Both of these procedures were also high in terms of mean allowed charges as a percent of primary procedure mean allowed charges (Table 4-14). Overall, the mean RVU of both therapeutic and diagnostic usually-global procedures amounted to less than one percent of mean primary procedure RVU.

*Lasker, R., A. Mongoven, D.C. Colby, P.B. Ginsburg, "Medicare Surgical Global Fees: The Relationship Between Included Services and Payment," *Inquiry* 27:255-262 (Fall 1990).

4.4 Procedures Performed Through the Same Surgical Incision

The third deviation from the single-physician, single-bill fee schedule model is when two or more surgeons perform different procedures through the same surgical incision. This section presents the results of having our consultants classify each secondary procedure, within each procedure group, according to whether it is "usually performed through the same surgical incision as the primary procedure." From here on, for clarity, these types of secondary procedures will be referred to as "same-incision" procedures.

In 1986, total allowed charges for same-incision procedures were \$49.3 million, rising to \$87.2 million in 1989, an increase of 77 percent (Tables 4-18 and 4-19). Therapeutic procedures accounted for the vast majority of these dollars (over 80 percent each year).

Similar to secondary procedures billed outside of the global package, allowed charges for same-incision procedures comprised a very small proportion of total allowed charges for the index procedure. Overall, in 1989, allowed charges for same-incision secondary procedures only accounted for 2.3 percent of allowed charges for the primary procedures (Table 4-19).

Variation by Index Procedure

Total allowed charges for therapeutic same-incision procedures as a percent of total allowed charges for the primary procedure was highest for enterectomy (12 percent in 1989) (Table 4-19). The most frequent therapeutic secondary procedures performed through the same incision as the enterectomy were CPT 44005 (enterolysis), CPT 43830 (gastrostomy), and CPT 49560 (repair of ventral hernia). Together, these procedures accounted for 46 percent of all therapeutic same-incision procedures associated with enterectomy (Appendix B).

The index procedure with the next highest percentage of therapeutic same-incision allowed charges was aortic and mitral valve replacement with 11.3 percent in 1989. The most frequent therapeutic secondary procedure performed through the same incision as the aortic or mitral valve replacement was coronary artery bypass graft (CPT 33510 and CPT 33511). CABG accounted for 70 percent of all therapeutic same-incision procedures associated with aortic or mitral valve replacement (Appendix B).

Knee-arthroscopy had the next highest percentage of therapeutic same-incision allowed charges (10.7 percent in 1989). In fact, all of the secondary procedures classified as therapeutic usually-global were also classified as being performed through the same incision as the knee-arthroscopy.

Some other index procedures with relatively high percentages of therapeutic same-incision allowed charges in 1989 were enterolysis (8.8 percent), laminectomy (7.7 percent), and total hysterectomy (6.0 percent).

For same-incision diagnostic procedures, PTCA was the only index procedure with a percent of allowed charges exceeding 2 percent in 1989. For PTCA, diagnostic same-incision secondary procedures amounted to 10.8 percent of primary procedure allowed charges. The most frequently billed diagnostic same-incision procedure is CPT 93547, "Combined left-heart catheterization, selective coronary angiography, one or more coronary arteries, and selective left ventricular angiography" (Appendix B).

Variation in Average Allowed Charges Per Case

Average allowed charges per case for same-incision procedures were \$22 in 1986 and \$34 in 1989 across all procedures, the vast majority being for therapeutic procedures (Tables 4-20 and 4-21). In comparison, per-case allowed charges for procedures not usually performed through the same surgical incision as the index procedure were \$12 in 1986 and \$15 in 1989.

Knee arthroscopy, aortic or mitral valve replacement, laminectomy, and enterectomy were procedures with relatively high proportions of allowed charges for same-incision therapeutic procedures compared to therapeutic procedures not usually performed through the same surgical incision (Table 4-21). PTCA had a disproportionately high mean allow charge for diagnostic same-incision procedures, amounting to 10.8 percent of allowed charges for the primary procedure. These procedures are likely to have been cardiac catheter procedures, necessary to define the lesions to be treated with angioplasty.

Variation by Patient, Physician, and Facility Characteristics

Allowed charges for same-incision procedures as a percent of allowed charges for primary procedures did not vary considerably by patient, physician, and facility characteristics. The most variation was by the specialty of the primary surgeon (Tables 4-22

and 4-23). This ratio was higher for neurosurgeons than for other surgical specialties, but even here the ratio of same-incision charges to primary procedure charges was only 4.2 percent for therapeutic procedures in 1989.

4.4.1 Relative Value Units of Work Performed Through the Same Surgical Incision as the Index Procedure

The amount of secondary surgery performed through the same surgical incision as the primary surgery can be measured by RVUs as well as by mean allowed charges. If a same-incision secondary procedure has assigned to it an RVU that is similar or equal to that of the primary procedure, a policy concern arises: should the work RVU for the secondary procedure be lowered to reflect the reduced amount of work required (since the incision has already been made)?

Table 4-24 compares work RVUs for same-incision secondary procedures to work RVUs of the primary procedures. Similar to the RVU analysis with respect to usually-global procedures, the mean RVU for therapeutic same-incision procedures as a percent of the mean RVU of primary procedures was high for renal transplantation and knee arthroscopy. The mean RVU for therapeutic same-incision procedures was also comparatively high for laminectomy and carpal tunnel repair. The mean RVU for same-incision diagnostic procedures was comparatively high for PTCA, consistent with the allowed charge results presented earlier. Overall, both therapeutic and diagnostic same-incision mean RVUs amounted to less than one percent of mean primary procedure RVUs.

TABLE 4-1

TOTAL NUMBER OF EPISODES AND MEAN ALLOW CHARGE FOR PRIMARY SURGEON CLAIMS,
1986 AND 1989

Index procedure	1986 Total number of episodes	1986	1989	1989
		Mean Allow Charge for Primary Surgeon Claim	1989 Total number of episodes	Mean Allow Charge for Primary Surgeon Claim
MASTECTOMY	2,114	\$ 989	2,362	\$ 1,064
HIP REPLACEMENT	3,743	2,232	4,615	2,308
REPAIR OF FEMORAL FRACTURE	7,171	1,196	7,910	1,275
KNEE ARTHROPLASTY	2,553	2,297	3,690	2,345
LEG OR THIGH AMPUTATION	1,989	760	2,088	835
KNEE ARTHROSCOPY	756	972	1,338	1,112
LUNG LOBECTOMY	668	1,605	687	1,788
PERMANENT PACEMAKER INSERTION	3,225	1,086	3,457	1,163
A/M VALVE	545	3,083	735	3,355
CABG	4,014	3,916	5,496	4,128
EMBOLECTOMY, FEMOROPopliteal	668	852	554	932
REPAIR ABDOMINAL ANEURYSM	1,303	2,275	1,467	2,486
CAROTID ENDARTERECTOMY	2,408	1,556	2,128	1,722
BYPASS GRAFT, LEG	1,699	1,765	1,692	1,981
CHOLECYSTECTOMY	6,038	909	5,969	980
EXPLORATORY LAPAROTOMY	993	642	910	703
INGUINAL HERNIA REPAIR	5,266	559	5,796	599
VENTRAL HERNIA REPAIR	1,211	691	1,452	748
RENAL TRANSPLANTATION	260	2,219	273	2,463
TURP	10,780	1,078	10,407	1,126
TOTAL HYSTERECTOMY	1,273	971	1,304	1,025
VAGINAL HYSTERECTOMY	850	984	841	1,067
LAMINECTOMY	577	1,744	577	1,934
LAMINOTOMY	972	1,555	1,108	1,730
CARPAL TUNNEL REPAIR	1,923	495	2,593	496
CATARACT EXTRACTION	39,314	1,676	46,613	1,564
INTRAOCULAR LENS INSERTION	1,649	1,116	1,026	1,057
PTCA	1,426	1,356	3,747	1,491
SUPRAPUBIC PROSTATECTOMY	340	1,133	229	1,212
D AND C OF UTERUS	2,310	253	2,328	260
ENTEROLYSIS	705	820	1,010	891
ENTERECTOMY	881	1,046	964	1,095
COLECTOMY	4,719	1,263	5,106	1,362
TOTAL	114,343	1,444	130,472	1,503

Source: 1986 5% BMAD Beneficiary File.

TABLE 4-2
ALLOWED CHARGES FOR ASSISTANCE AT SURGERY CLAIMS, 1986

Index procedure	Mean allow charge for assistant surgeon claims						Total allowed charges for assistant surgeons as a percent of total allowed charges for primary surgeons
	Mean allow charge for primary surgeon claim	Percent of cases with at least one assistant surgeon claim	Mean allow charge for assistant surgeon claims	as a percent of mean allow charge for primary surgeon claim	Total allowed charge for primary surgeon claim	Total allowed charges for assistant surgeons (*)	
MASTECTOMY	\$ 989	42.6%	\$ 203	20.5%	\$ 41,828,640	\$ 3,842,040	9.2%
HIP REPLACEMENT	2,232	42.3	474	21.2	167,050,380	15,859,240	9.5
REPAIR OF FEMORAL FRACTURE	1,196	26.0	271	22.6	171,549,200	10,391,440	6.1
KNEE ARTHROPLASTY	2,297	50.8	504	22.0	117,270,120	14,011,960	11.9
LEG OR THIGH AMPUTATION	760	23.2	178	23.4	30,238,980	1,753,840	5.8
KNEE ARTHROSCOPY	972	10.8	267	27.5	14,701,380	508,160	3.5
LUNG LOBECTOMY	1,605	47.0	337	21.0	21,437,340	2,256,340	10.5
PERMANENT PACEMAKER INSERTION	1,086	11.2	393	36.2	70,038,760	2,919,320	4.2
A/M VALVE	3,083	56.1	652	21.1	33,808,160	5,476,260	16.3
CABG	3,916	60.3	798	20.4	314,387,920	47,403,740	15.1
EMBOLECTOMY, FEMOROPOLITEAL	852	26.2	220	25.9	11,380,980	894,120	7.9
REPAIR ABDOMINAL ANEURYSM	2,275	52.6	473	20.8	59,275,880	7,281,340	12.3
CAROTID ENDARTERECTOMY	1,558	51.8	334	21.5	74,943,560	8,533,880	11.4
BYPASS GRAFT, LEG	1,765	46.4	386	21.8	59,988,040	7,197,480	12.0
CHOLECYSTECTOMY	909	47.2	185	20.3	109,750,520	11,016,280	10.0
EXPLORATORY LAPAROTOMY	642	31.8	134	20.8	12,759,420	900,360	7.1
INGUINAL HERNIA REPAIR	559	32.7	136	24.3	58,881,680	5,015,880	8.5
VENTRAL HERNIA REPAIR	691	34.3	155	22.4	16,747,580	1,335,520	8.0
RENAL TRANSPLANTATION	2,219	21.9	551	24.8	11,538,740	749,220	6.5
TURP	1,078	0.7	257	23.9	232,419,200	386,220	0.2
TOTAL HYSTERECTOMY	971	47.4	193	19.8	24,710,780	2,534,080	10.3
VAGINAL HYSTERECTOMY	984	48.1	191	19.4	16,728,780	1,687,740	10.1
LAMINECTOMY	1,744	34.0	379	21.8	20,127,960	1,783,220	8.9
LAMINOTOMY	1,555	42.8	338	21.8	30,221,800	3,999,560	13.2
CARPAL TUNNEL REPAIR	495	5.4	187	37.8	19,037,940	427,180	2.2
CATARACT EXTRACTION	1,676	9.8	393	23.4	1,317,473,020	31,306,300	2.4
INTRAOCULAR LENS INSERTION	1,116	13.2	334	29.9	36,821,640	1,689,940	4.6
PTCA	1,356	10.2	437	32.2	38,685,360	1,434,460	3.7
SUPRAPUBIC PROSTATECTOMY	1,133	49.7	223	19.7	7,706,040	843,460	10.9
D AND C OF UTERUS	253	0.6	193	76.2	11,695,220	54,040	0.5
ENTEROLYSIS	820	39.0	166	20.3	11,558,080	1,092,380	9.5
ENTERECTOMY	1,046	37.3	214	20.5	18,435,740	1,701,580	9.2
COLECTOMY	1,263	47.5	239	19.0	119,167,120	12,331,620	10.3
TOTAL	1,444	23.5	354	24.5	3,302,161,900	208,618,240	6.3

Source: 1986 5% BMAD Beneficiary File.

(*) - Total allowed charges from the five percent sample were multiplied by 20 to obtain national estimates.

TABLE 4-3
ALLOWED CHARGES FOR ASSISTANCE AT SURGERY CLAIMS, 1989

Index procedure	Mean allow charge for primary surgeon claim	Percent of cases with at least one assistant surgeon claim	Mean allow charge for assistant surgeon claims as a percent of mean allow charge for primary surgeon claim			Total allowed charges for primary surgeon (*)	Total allowed charges for assistant surgeons (*)	Total allowed charges for assistant surgeon as a percent of total allowed charges for primary surgeon
			Mean allow charge for assistant surgeon claims	as a percent of mean allow charge for primary surgeon claim	Total allowed charges for primary surgeon claim			
MASTECTOMY	\$ 1,064	43.8%	\$ 220	20.7%	\$ 50,242,320	\$ 4,872,780	9.7%	
HIP REPLACEMENT	2,308	48.2	467	20.2	213,045,640	21,155,280	9.9	
REPAIR OF FEMORAL FRACTURE	1,275	25.8	278	21.8	201,721,940	11,662,540	5.8	
KNEE ARTHROPLASTY	2,345	51.4	511	21.8	173,044,340	21,105,820	12.2	
LEG OR THIGH AMPUTATION	835	21.9	219	26.3	34,889,620	2,131,860	6.1	
KNEE ARTHROSCOPY	1,112	14.4	308	27.7	29,754,780	1,433,540	4.8	
LUNG LOBECTOMY	1,788	51.1	347	19.4	24,564,760	2,756,200	11.2	
PERMANENT PACEMAKER INSERTION	1,163	8.3	510	43.8	80,377,140	2,978,800	3.7	
A/M VALVE	3,355	69.0	671	20.0	49,317,700	8,993,440	18.2	
CABG	4,128	67.6	779	18.9	453,770,380	69,453,060	15.3	
EMBOLECTOMY, FEMOROPopliteal	932	25.8	278	29.7	10,322,040	1,000,640	9.7	
REPAIR ABDOMINAL ANEURYSM	2,486	58.1	493	19.8	72,935,720	9,493,060	13.0	
CAROTID ENDARTERECTOMY	1,722	51.8	351	20.4	73,301,560	7,927,380	10.8	
BYPASS GRAFT, LEG	1,981	49.2	423	21.4	67,052,820	8,601,160	12.8	
CHOLECYSTECTOMY	980	45.7	194	19.8	116,936,140	11,212,460	9.6	
EXPLORATORY LAPAROTOMY	703	31.2	143	20.3	12,796,640	883,320	6.9	
INGUINAL HERNIA REPAIR	599	28.0	157	26.2	69,465,580	5,576,240	8.0	
VENTRAL HERNIA REPAIR	748	31.4	181	21.5	21,732,780	1,593,540	7.3	
RENAL TRANSPLANTATION	2,463	17.9	640	26.0	13,447,620	755,360	5.6	
TURP	1,126	0.7	308	27.4	234,360,020	499,180	0.2	
TOTAL HYSTERECTOMY	1,025	45.4	194	19.0	26,722,700	2,639,900	9.9	
VAGINAL HYSTERECTOMY	1,067	46.1	221	20.8	17,946,600	1,979,600	11.0	
LAMINECTOMY	1,934	36.6	455	23.5	22,320,440	2,320,340	10.4	
LAMINOTOMY	1,730	44.5	362	20.9	38,341,260	5,575,140	14.5	
CARPAL TUNNEL REPAIR	496	5.5	192	38.8	25,711,680	638,280	2.5	
CATARACT EXTRACTION	1,564	6.3	379	24.3	1,458,001,840	23,588,540	1.6	
INTRAOCULAR LENS INSERTION	1,057	9.8	279	26.4	21,687,620	686,800	3.2	
PTCA	1,491	14.9	488	32.7	111,731,100	6,100,640	5.5	
SUPRAPUBIC PROSTATECTOMY	1,212	48.9	236	19.5	5,549,700	575,880	10.4	
D AND C OF UTERUS	260	0.5	167	64.4	12,086,180	46,780	0.4	
ENTEROLYSIS	891	38.2	167	18.8	18,001,500	1,569,720	8.7	
ENTERECTOMY	1,095	40.8	221	20.2	21,120,500	2,393,280	11.3	
COLECTOMY	1,362	46.7	260	19.1	139,088,980	14,640,340	10.5	
TOTAL	1,503	22.6	388	25.8	3,921,389,660	256,838,720	6.5	

Source: 1989 5% BMAD Beneficiary File.

(*) - Total allowed charges from the five percent sample were multiplied by 20 to obtain national estimates.

TABLE 4-4

ASSISTANT SURGEON CLAIMS PER ASSISTANT SURGEON EPISODE, BY INDEX PROCEDURE:
1986 AND 1989

<u>Index procedure</u>	<u>1986</u> Assistant surgeon claims per assistant <u>surgeon episode</u>	<u>1989</u> Assistant surgeon claims per assistant <u>surgeon episode</u>
MASTECTOMY	1.05	1.07
HIP REPLACEMENT	1.06	1.06
REPAIR OF FEMORAL FRACTURE	1.03	1.03
KNEE ARTHROPLASTY	1.07	1.09
LEG OR THIGH AMPUTATION	1.07	1.06
KNEE ARTHROSCOPY	1.16	1.21
LUNG LOBECTOMY	1.07	1.13
PERMANENT PACEMAKER INSERTION	1.02	1.02
A/M VALVE	1.37	1.32
CABG	1.23	1.20
EMBOLECTOMY, FEMOROPopliteal	1.16	1.27
REPAIR ABDOMINAL ANEURYSM	1.12	1.13
CAROTID ENDARTERECTOMY	1.02	1.02
BYPASS GRAFT, LEG	1.18	1.22
CHOLECYSTECTOMY	1.05	1.06
EXPLORATORY LAPAROTOMY	1.07	1.09
INGUINAL HERNIA REPAIR	1.07	1.10
VENTRAL HERNIA REPAIR	1.04	1.09
RENAL TRANSPLANTATION	1.19	1.20
TURP	1.01	1.04
TOTAL HYSTERECTOMY	1.09	1.15
VAGINAL HYSTERECTOMY	1.08	1.15
LAMINECTOMY	1.20	1.21
LAMINOTOMY	1.42	1.56
CARPAL TUNNEL REPAIR	1.11	1.16
CATARACT EXTRACTION	1.03	1.06
INTRAOCULAR LENS INSERTION	1.16	1.22
PTCA	1.12	1.12
SUPRAPUBIC PROSTATECTOMY	1.12	1.09
D AND C OF UTERUS	1.08	1.17
ENTEROLYSIS	1.20	1.22
ENTERECTOMY	1.21	1.38
COLECTOMY	1.15	1.18
 TOTAL	 1.10	 1.12

Source: 1986 5% BMAD Beneficiary File.

TABLE 4-5
RATES OF ASSISTANCE AT SURGERY BY PROCEDURE GROUP, 1989

<u>Index procedure</u>	High (>33%)		Medium (11-33%)		Low (<=10%)		Percent of cases with at least one assistant <u>surgeon claim</u>	Percent of cases with at least one assistant <u>Index procedure</u>	Percent of cases with at least one assistant <u>surgeon claim</u>	Percent of cases with at least one assistant <u>Index procedure</u>	Percent of cases with at least one assistant <u>surgeon claim</u>
	Percent of cases with at least one assistant <u>surgeon claim</u>	Percent of cases with at least one assistant <u>Index procedure</u>	Percent of cases with at least one assistant <u>surgeon claim</u>	Percent of cases with at least one assistant <u>Index procedure</u>	Percent of cases with at least one assistant <u>surgeon claim</u>	Percent of cases with at least one assistant <u>Index procedure</u>					
A/M VALVE REPLACEMENT	69.0	% VENTRAL HERNIA REPAIR	31.4	% INTRAOCCULAR LENS INSERTION	9.8	%					
CABG	67.6	EXPLORATORY LAPAROTOMY	31.2	PERMANENT PACEMAKER INSERTION	8.3						
REPAIR ABDOMINAL ANEURYSM	58.1	INGUINAL HERNIA REPAIR	28.0	CATARACT EXTRACTION	6.3						
CAROTID ENDARTERECTOMY	51.8	REPAIR OF FEMORAL FRACTURE	25.8	CARPAL TUNNEL REPAIR	5.5						
KNEE ARTHROPLASTY	51.4	EMBOLECTOMY, FEMOROPPOPITEAL	25.6	TURP	0.7						
LUNG LOBECTOMY	51.1	LEG OR THIGH AMPUTATION	21.9	D AND C OF UTERUS	0.5						
BYPASS GRAFT, LEG	49.2	RENAL TRANSPLANTATION	17.9								
SUPRAPUBIC PROSTATECTOMY	48.9	PTCA	14.9								
COLECTOMY	46.7	KNEE ARTHROSCOPY	14.4								
HIP REPLACEMENT	46.2										
VAGINAL HYSTERECTOMY	46.1										
CHOLECYSTECTOMY	45.7										
TOTAL HYSTERECTOMY	45.4										
LAMINOTOMY	44.5										
MASTECTOMY	43.8										
ENTERECTOMY	40.8										
ENTEROLYSIS	38.2										
LAMINECTOMY	36.6										

Source: 1989 5% BMAD Beneficiary File.

TABLE 4-6
RATES AND ALLOWED CHARGES FOR ASSISTANCE AT SURGERY CLAIMS, BY BENEFICIARY
AND FACILITY CHARACTERISTICS, 1989

Beneficiary Characteristics	Mean allow charge for primary surgeon claim	Percent of cases with at least one assistant surgeon claim	Mean allow charge for assistant surgeon claims as a percent of mean allow charge for primary surgeon claim			Total allowed charges for primary surgeon (*)	Total allowed charges for assistant surgeons (*)	Total allowed charges for surgeon as a percent of total allowed charges for primary surgeon
			Mean allow charge for assistant surgeon claims	as a percent of mean allow charge for primary surgeon claim	Total allowed charges for primary surgeon			
TOTAL (a)	\$ 1,503	22.6%	\$ 388	25.8%	\$ 3,921,389,660	\$ 256,838,720		6.5%
AGE								
LESS THAN 65	1,546	20.6	426	27.5	193,872,140	15,824,640		8.2
65-74	1,547	22.2	410	26.5	1,827,703,940	135,310,980		7.4
75-84	1,483	23.1	373	25.1	1,492,704,380	86,710,640		5.8
85 AND OVER	1,375	23.8	303	22.1	407,109,200	18,992,480		4.7
SEX								
UNKNOWN	1,546	18.0	303	19.6	742,160	42,440		5.7
MALE	1,531	21.2	425	27.8	1,747,198,680	124,030,420		7.1
FEMALE	1,481	22.6	359	24.2	2,173,448,800	132,765,860		6.1
RACE								
UNKNOWN	1,566	25.0	397	25.4	34,730,420	2,726,700		7.9
WHITE	1,504	22.9	388	25.8	3,582,219,380	238,028,060		6.6
BLACK	1,450	17.1	378	28.0	234,869,800	10,729,640		4.6
OTHER	1,601	25.5	428	26.8	69,570,060	5,354,340		7.7
DIVISION								
NEW ENGLAND	1,446	22.1	328	22.7	187,581,520	10,131,640		5.4
MIDDLE ATLANTIC	1,611	24.1	407	25.3	647,977,080	42,378,120		6.5
SOUTH ATLANTIC	1,464	19.2	400	27.3	718,277,320	41,241,920		5.7
EAST NORTH CENTRAL	1,512	16.7	384	25.4	739,370,400	34,474,640		4.7
EAST SOUTH CENTRAL	1,320	17.3	339	25.7	237,415,140	11,144,400		4.7
WEST NORTH CENTRAL	1,246	18.8	334	26.8	288,469,160	14,750,640		5.5
WEST SOUTH CENTRAL	1,542	22.0	391	25.4	450,548,860	27,281,840		6.1
MOUNTAIN	1,438	30.5	348	24.2	145,688,560	15,237,520		10.5
PACIFIC	1,700	38.3	419	24.6	527,061,620	60,198,020		11.4
SPECIALTY								
GENERAL SURGERY	1,116	38.3	255	22.8	609,674,900	60,137,760		9.9
CARDIOVASCULAR DISEASE	1,733	23.6	590	34.0	184,011,780	16,523,880		9.0
OBSTETRICS/GYNECOLOGY	658	22.4	210	31.9	50,981,000	4,157,820		8.2
NEUROLOGICAL SURGERY	1,498	29.6	390	26.1	47,442,300	4,622,040		9.7
OPHTHALMOLOGY	1,564	6.5	373	23.8	1,452,294,140	23,946,420		1.6
ORTHOPEDIC SURGERY	1,644	33.1	409	24.9	628,667,740	56,493,280		9.0
THORACIC SURGERY	2,838	53.1	639	22.5	530,062,080	76,055,240		14.3
UROLOGY	1,135	2.1	282	24.8	232,940,620	1,347,480		0.6
OTHER	1,276	24.7	339	26.5	185,315,100	13,554,800		7.3
Facility Characteristics								
TOTAL	1,588	34.8	396	25.0	2,134,629,340	209,422,160		9.8
BED SIZE								
LESS THAN 100	1,140	45.0	249	21.8	152,027,800	16,118,920		10.6
100-199	1,387	43.2	337	24.3	345,687,700	38,151,540		11.0
200-299	1,534	38.9	389	25.3	479,859,740	52,302,880		10.9
300-399	1,650	34.3	438	26.5	362,015,680	38,758,960		10.7
400-499	1,708	29.6	453	26.5	268,762,300	24,952,380		9.3
500 AND OVER	1,937	19.5	543	28.0	526,276,100	39,137,480		7.4
OWNERSHIP								
PUBLIC, NOT FOR PROFIT	1,432	34.3	349	24.4	226,922,900	21,068,400		9.3
PRIVATE, NOT FOR PROFIT	1,611	33.7	403	25.0	1,680,066,600	160,218,080		9.5
PRIVATE, FOR PROFIT	1,594	42.9	400	25.1	227,639,840	28,135,680		12.4
TEACHING STATUS								
NON-TEACHING HOSPITAL	1,446	43.9	356	24.6	1,071,912,080	125,647,920		11.7
TEACHING HOSPITAL	1,764	23.6	477	27.0	1,062,717,280	83,774,240		7.9

Source: 1988 5% BMAD Beneficiary File.

(a) Beneficiary totals and facility totals differ because it was not possible to merge facility-level data to all episodes.

TABLE 4-7
HOSPITAL CHARACTERISTICS BY INDEX PROCEDURE, 1989

INDEX PROCEDURE	TEACHING STATUS		BEDSIZE		OWNERSHIP	
	TEACHING	NON-TEACHING	≤100	200-299	300-399	400-499
1 Mastectomy	40.19%	59.81%	13.51%	20.47%	23.34%	11.34%
2 Hip Replacement	46.00	54.00	8.33	20.37	24.31	18.70
3 Femoral Fracture	35.92	64.08	14.02	23.30	24.77	14.95
4 Knee A-Plasty	44.72	55.28	8.17	21.38	24.81	16.85
5 L-Amputation	43.18	56.82	12.35	20.70	23.09	14.80
6 Knee A-Scopy	33.00	67.00	7.00	20.00	32.00	15.00
7 L-Lobectomy	52.09	47.91	4.34	16.08	23.63	18.01
8 Pacemaker	43.88	56.12	7.02	19.33	23.63	18.28
9 AM Valve	72.08	27.92	0.00	4.86	16.39	17.45
10 CABG	69.38	30.62	0.34	5.77	16.44	18.70
11 Embolectomy	45.03	54.97	7.51	18.05	26.17	18.05
12 AB-Aneurysm	50.30	49.70	4.27	14.54	25.28	19.27
13 Endarterect	46.88	53.12	4.47	15.73	26.64	16.72
14 Bypass Graft	48.59	51.42	4.08	16.39	27.45	18.30
15 Cholecystectomy	34.49	65.51	17.00	22.16	22.61	15.01
16 Laparotomy	42.71	57.29	11.83	17.59	25.63	14.95
17 Ing-Hernia	40.76	59.24	17.25	18.03	24.41	15.10
18 Vent-Hernia	37.80	62.20	14.83	20.20	24.84	14.21
19 Renal Trans	92.89	7.11	0.00	1.78	7.11	18.89
20 TURP	38.16	61.84	12.25	21.77	24.90	15.23
21 T-Hysterect	42.86	57.14	11.60	20.17	20.89	17.75
22 V-Hysterect	42.97	57.03	9.94	20.52	24.26	16.52
23 Laminectomy	52.22	47.78	3.70	16.48	23.15	18.26
24 Laminotomy	49.35	50.65	3.32	15.28	25.63	18.98
25 Carpal Rep	55.58	44.44	9.72	5.56	26.39	27.78
26 Cataract Ex	65.98	34.02	8.68	32.42	19.06	11.64
27 Lens Insert	61.90	38.10	4.76	47.62	19.05	4.76
28 PTCA	59.73	40.27	0.98	7.23	19.89	18.78
29 S-Prostalec	42.52	57.48	12.15	23.36	21.50	17.76
30 D and C	45.31	54.69	9.06	19.74	20.71	17.80
31 Enterolysis	38.97	61.03	15.90	20.49	22.86	14.00
32 Enterectomy	37.03	62.97	16.16	17.45	23.70	18.27
33 Colectomy	40.08	59.92	12.33	20.16	23.73	16.20
TOTAL	44.84	55.16	9.92	18.54	23.28	16.33
						11.71
						20.22
						11.78
						77.58
						10.62

SOURCE: 1989 5% BMAD Beneficiary File

TABLE 4-8
RELATIVE WORK UNITS FOR PROCEDURES PERFORMED BY AN ASSISTANT SURGEON, 1989

<u>Index Procedure</u>	<u>Mean Relative Work Units for Index Procedure</u>	<u>Mean Relative Work Units Per Episode for Assistant Surgeons</u>	<u>Mean Relative Work Units Per Episode for an Assistant Surgeons as a Percent of Mean Relative Value Units for the Index Procedure</u>
MASTECTOMY	13.09	0.9505	7.26%
HIP REPLACEMENT	18.78	1.4836	7.90
FEMORAL FRACTURE	14.87	0.6344	4.27
KNEE ARTHROPLASTY	20.63	1.8203	8.82
LEG OR THIGH AMPUTATION	10.93	0.4033	3.69
KNEE ARTHROSCOPY	7.99	0.2212	2.77
LUNG LOBECTOMY	18.50	1.6477	8.91
PERMANENT PACEMAKER INSERTION	7.55	0.1033	1.37
A/M VALVE	25.99	3.7456	14.41
CABG	26.89	3.4720	12.91
EMBOLECTOMY, FEMOROPOLITEAL	9.75	0.5144	5.28
REPAIR ABDOMINAL ANEURYSM	24.15	2.4683	10.22
CAROTID ENDARTERECTOMY	17.07	1.4516	8.50
BYPASS GRAFT, LEG	17.28	1.6046	9.28
CHOLECYSTECTOMY	11.14	0.8519	7.65
EXPLORATORY LAPAROTOMY	9.47	0.4989	5.27
INGUINAL HERNIA REPAIR	5.53	0.2717	4.92
VENTRAL HERNIA REPAIR	8.18	0.4415	5.40
RENAL TRANSPLANTATION	26.63	0.8229	3.09
TURP	12.13	0.0149	0.12
TOTAL HYSTERECTOMY	13.74	1.0729	7.81
VAGINAL HYSTERECTOMY	17.98	1.3876	7.72
LAMINECTOMY	16.57	1.0901	6.58
LAMINOTOMY	12.46	0.8908	7.15
CARPAL TUNNEL REPAIR	4.20	0.0440	1.05
CATARACT EXTRACTION	10.20	0.1091	1.07
INTRAOCULAR LENS INSERTION	8.32	0.1637	1.97
PTCA	10.10	0.1599	1.58
SUPRAPUBIC PROSTATECTOMY	13.69	1.1659	8.52
D AND C OF UTERUS	2.58	0.0026	0.10
ENTEROLYSIS	10.68	0.7624	7.14
ENTERECTOMY	13.87	1.1369	8.20
COLECTOMY	15.78	1.3224	8.38
TOTAL	12.36	0.6298	5.10

Source: 1986 5% BMAD Beneficiary File

TABLE 4-9
FREQUENCY OF ASSISTANCE AT SURGERY FOR 33 PROCEDURE GROUPS BY CARRIER

<u>Carrier</u>	Total <u>Surgical Claims</u>	Claims for <u>Assistant Surgeons</u>	<u>Percent</u>
Alabama	2,368	382	16.1%
Alaska	45	30	66.7
Arizona	2,087	642	30.8
Arkansas	1,548	226	14.6
California (northern)	5,857	2,206	37.7
California (southern)	6,383	2,334	36.6
Colorado	1,326	527	39.7
Connecticut	1,470	310	21.1
Delaware	289	12	4.2
District of Columbia	1,057	76	7.2
Florida	9,578	1,971	20.6
Georgia	2,860	462	16.2
Hawaii	304	23	7.6
Idaho	486	154	31.7
Illinois	5,578	1,004	18.0
Indiana	3,013	447	14.8
Iowa	1,596	351	22.0
Kansas	933	222	23.8
Kansas City	1,210	147	12.1
Kentucky	1,715	308	18.0
Louisiana	2,238	480	21.4
Maine	601	166	27.6
Maryland	1,435	310	21.6
Massachusetts	3,245	583	18.0
Michigan	4,794	726	15.1
Minnesota (Minneapolis area)	769	63	8.2
Minnesota (rural)	693	142	20.5
Mississippi	1,295	214	16.5
Missouri	2,263	329	14.5
Montana	301	105	34.9
Nebraska	1,070	249	23.3
Nevada	473	163	34.5
New Hampshire/Vermont	640	206	32.2
New Mexico	545	205	37.6
New York (NYC area)	4,548	1,127	24.8
New York (Queens)	4,192	1,617	38.6
New York (upstate)	2,846	727	25.5
North Carolina	3,409	430	12.6
North Dakota	935	194	20.7
Ohio	5,605	581	10.4
Oklahoma	1,743	333	19.1
Oregon	1,586	623	39.3
Pennsylvania	7,010	865	12.3
Rhode Island	600	182	30.3
South Carolina	1,261	147	11.7
Tennessee	2,848	249	8.7
Texas	7,906	1,559	19.7
Utah	474	95	20.0
Virginia	2,001	164	8.2
Washington (state)	2,339	691	29.5
West Virginia	899	88	9.8
Wyoming	115	44	38.3

Source: 1986 5 % BMAD Beneficiary File

TABLE 4-10

FREQUENCY OF ASSISTANCE AT SURGERY FOR 33 PROCEDURE GROUPS, BY CARRIER (1989)

<u>Carrier</u>	Total <u>Claims</u>	Claims for <u>Surgeons</u>	<u>Percent</u>
Alabama	2,663	623	23.4%
Alaska	44	18	40.9
Arizona	1,232	564	45.8
Arkansas	1,827	218	11.9
California (northern)	5,814	1,953	33.6
California (southern)	6,060	2,286	37.7
Colorado	1,290	342	26.5
Connecticut	1,719	339	19.7
Delaware	347	14	4.0
District of Columbia	1,175	107	9.1
Florida	10,944	2,229	20.4
Georgia	1,942	496	25.5
Hawaii	169	31	18.3
Idaho	516	165	32.0
Illinois	5,859	954	16.3
Indiana	3,350	483	14.4
Iowa	1,888	380	20.1
Kansas	1,361	327	24.0
Kansas City	1,259	171	13.6
Kentucky	1,860	310	16.7
Louisiana	2,491	417	16.7
Maine	745	223	29.9
Maryland	1,636	290	17.7
Massachusetts	3,302	625	18.9
Michigan	5,265	814	15.5
Minnesota (Minneapolis area)	908	101	11.1
Minnesota (rural)	778	29	3.7
Mississippi	1,406	198	14.1
Missouri	2,511	297	11.8
Montana	457	138	30.2
Nebraska	1,158	255	22.0
Nevada	304	139	45.7
New Hampshire/Vermont	808	200	24.8
New Jersey	3,651	1,016	27.8
New Mexico	340	154	45.3
New York (NYC area)	4,711	1,479	31.4
New York (Queens)	416	98	23.6
New York (upstate)	3,140	800	25.5
North Carolina	3,763	566	15.0
North Dakota	1,018	235	23.1
Ohio	6,331	743	11.7
Oklahoma	1,266	400	31.6
Oregon	1,191	535	44.9
Pennsylvania	8,117	1,115	13.7
South Carolina	1,688	213	12.6
Tennessee	3,073	282	9.2
Texas	9,218	1,679	18.2
Utah	778	122	15.7
Virginia	2,168	256	11.8
Washington (state)	2,569	706	27.5
West Virginia	1,065	122	11.5
Wisconsin	2,984	639	21.4
Wyoming	127	58	45.7

Source: 1989 5 % BMAD Beneficiary File

TABLE 4-11

TOTAL ALLOWED CHARGES FOR PROCEDURES USUALLY BILLED AS PART OF THE GLOBAL PACKAGE, THERAPEUTIC AND DIAGNOSTIC: 1986

<u>Index procedure</u>	<u>Total allowed charges for primary surgeons</u>	Therapeutic		Diagnostic	
		<u>Total allowed charges</u>	<u>As percent of primary surgeon's total allowed charges</u>	<u>Total allowed charges</u>	<u>As percent of primary surgeon's total allowed charges</u>
MASTECTOMY	\$ 41,828,640	\$ 48,060	0.1%	\$ 696,040	1.7%
HIP REPLACEMENT	167,050,380	165,000	0.1	0	0.0
REPAIR OF FEMORAL FRACTURE	171,549,200	0	0.0	0	0.0
KNEE ARTHROPLASTY	117,270,120	131,680	0.1	0	0.0
LEG OR THIGH AMPUTATION	30,236,960	6,120	0.0	0	0.0
KNEE ARTHROSCOPY	14,701,380	1,068,200	7.3	121,500	0.8
LUNG LOBECTOMY	21,437,340	152,380	0.7	161,540	0.8
PERMANENT PACEMAKER	70,036,760	371,080	0.5	0	0.0
AORTIC OR MITRAL VALVE REPLACEMENT	33,608,160	53,960	0.2	0	0.0
CABG	314,387,920	512,120	0.2	3,347,780	1.1
EMBOLECTOMY, FEMOROPOLITEAL	11,380,980	31,160	0.3	300	0.0
REPAIR ABDOMINAL ANEURYSM	59,275,880	0	0.0	0	0.0
CAROTID ENDARTERECTOMY	74,943,560	0	0.0	137,420	0.2
BYPASS GRAFT, LEG	59,988,040	243,580	0.4	0	0.0
CHOLECYSTECTOMY	109,750,520	155,280	0.1	0	0.0
EXPLORATORY LAPAROTOMY	12,759,420	171,460	1.3	13,780	0.1
INGUINAL HERNIA REPAIR	58,881,680	568,100	1.0	0	0.0
VENTRAL HERNIA REPAIR	16,747,580	16,800	0.1	0	0.0
RENAL TRANSPLANTATION	11,538,740	674,220	5.8	8,360	0.1
TURP	232,419,200	1,002,600	0.4	283,940	0.1
TOTAL HYSTERECTOMY	24,710,780	191,220	0.8	66,100	0.3
VAGINAL HYSTERECTOMY	16,728,780	74,700	0.4	2,920	0.0
LAMINECTOMY	20,127,960	771,300	3.8	0	0.0
LAMINOTOMY	30,221,800	137,420	0.5	0	0.0
CARPAL TUNNEL REPAIR	19,037,940	189,520	1.0	0	0.0
CATARACT EXTRACTION	1,317,473,020	4,438,040	0.3	0	0.0
INTRAOCULAR LENS INSERTION	36,821,640	1,219,300	3.3	0	0.0
PTCA	38,685,360	46,100	0.1	726,660	1.9
SUPRAPUBIC PROSTATECTOMY	7,706,040	272,960	3.5	45,520	0.6
D AND C OF UTERUS	11,695,220	0	0.0	42,140	0.4
ENTEROLYSIS	11,558,080	196,500	1.7	79,720	0.7
ENTERECTOMY	18,435,740	401,860	2.2	63,020	0.3
COLECTOMY	119,167,120	1,780,980	1.5	210,960	0.2
TOTAL	3,302,161,900	15,045,560	0.5	6,007,660	0.2

Source: 1986 5% BMAD Beneficiary File.

TABLE 4-12

TOTAL ALLOWED CHARGES FOR PROCEDURES USUALLY BILLED AS PART OF THE GLOBAL PACKAGE, THERAPEUTIC AND DIAGNOSTIC: 1989

Index procedure	Therapeutic		Diagnostic		
	Total allowed charges for primary surgeons	Total allowed charges	As percent of primary surgeon's total allowed charges	Total allowed charges	As percent of primary surgeon's total allowed charges
MASTECTOMY	\$ 50,242,320	\$ 38,540	0.1%	\$ 1,005,140	2.0%
HIP REPLACEMENT	213,045,640	236,800	0.1	0	0.0
REPAIR OF FEMORAL FRACTURE	201,721,940	0	0.0	0	0.0
KNEE ARTHROPLASTY	173,044,340	367,340	0.2	0	0.0
LEG OR THIGH AMPUTATION	34,889,620	13,680	0.0	0	0.0
KNEE ARTHROSCOPY	29,754,780	3,169,040	10.7	159,760	0.5
LUNG LOBECTOMY	24,564,760	262,300	1.1	464,840	1.9
PERMANENT PACEMAKER INSERTION	80,377,140	693,960	0.9	0	0.0
AORTIC OR MITRAL VALVE REPLACEMENT	49,317,700	94,760	0.2	0	0.0
CABG	453,770,380	928,620	0.2	4,650,480	1.0
EMBOLECTOMY, FEMOROPopliteal	10,322,040	74,500	0.7	0	0.0
REPAIR ABDOMINAL ANEURYSM	72,935,720	0	0.0	0	0.0
CAROTID ENDARTERECTOMY	73,301,560	0	0.0	115,340	0.2
BYPASS GRAFT, LEG	67,052,820	183,260	0.3	0	0.0
CHOLECYSTECTOMY	116,936,140	0	0.0	0	0.0
EXPLORATORY LAPAROTOMY	12,796,640	459,180	3.6	33,640	0.3
INGUINAL HERNIA REPAIR	69,465,580	860,620	1.2	0	0.0
VENTRAL HERNIA REPAIR	21,732,780	71,980	0.3	0	0.0
RENAL TRANSPLANTATION	13,447,620	794,700	5.9	14,140	0.1
TURP	234,360,020	1,325,280	0.6	191,380	0.1
TOTAL HYSTERECTOMY	26,722,700	247,920	0.9	185,020	0.7
VAGINAL HYSTERECTOMY	17,946,600	148,840	0.8	3,380	0.0
LAMINECTOMY	22,320,440	726,020	3.3	0	0.0
LAMINOTOMY	38,341,260	226,940	0.6	0	0.0
CARPAL TUNNEL REPAIR	25,711,680	315,140	1.2	0	0.0
CATARACT EXTRACTION	1,458,001,840	5,578,280	0.4	0	0.0
INTRAOCULAR LENS INSERTION	21,687,620	1,070,380	4.9	0	0.0
PTCA	111,731,100	0	0.0	1,220,580	1.1
SUPRAPUBIC PROSTATECTOMY	5,549,700	108,200	1.9	42,900	0.8
D AND C OF UTERUS	12,086,180	0	0.0	66,340	0.5
ENTEROLYSIS	18,001,500	388,920	2.2	151,380	0.8
ENTERECTOMY	21,120,500	537,740	2.5	194,540	0.9
COLECTOMY	139,088,980	2,422,780	1.7	365,920	0.3
TOTAL	3,921,389,660	21,345,700	0.5	8,864,760	0.2

Source: 1989 5% BMAD Beneficiary File.

TABLE 4-13

ADDITIONAL PROCEDURES ON THE SAME DAY OF SURGERY AS THE INDEX PROCEDURE,
USUALLY BILLED AS PART OF THE GLOBAL PACKAGE, 1986

Index procedure	Therapeutic Procedures						Diagnostic Procedures			
	Usually Included in Global Fee		Not Usually Included in Global Fee		Usually Included in Global Fee		Not Usually Included in Global Fee			
	Mean allow charge for primary surgeon claim	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case
MASTECTOMY	\$ 989	\$ 1.14	0.1%	\$ 0.73	0.1%	\$ 16.46	1.7%	\$ 0.38	0.0%	
HIP REPLACEMENT	2,232	2.20	0.1	17.42	0.8	0.00	0.0	0.00	0.0	
REPAIR OF FEMORAL FRACTURE	1,196	0.00	0.0	3.95	0.3	0.00	0.0	0.00	0.0	
KNEE ARTHROPLASTY	2,297	2.58	0.1	9.86	0.4	0.00	0.0	0.29	0.0	
LEG OR THIGH AMPUTATION	760	0.15	0.0	3.72	0.5	0.00	0.0	0.22	0.0	
KNEE ARTHROSCOPY	972	70.65	7.3	4.96	0.5	8.04	0.8	0.00	0.0	
LUNG LOBECTOMY	1,605	11.41	0.7	1.94	0.1	12.09	0.8	52.60	3.3	
PERMANENT PACEMAKER INSERTION	1,086	5.75	0.5	11.89	1.1	0.00	0.0	3.63	0.3	
A/M VALVE	3,083	4.95	0.2	412.89	13.4	0.00	0.0	18.44	0.6	
CABG	3,916	6.38	0.2	115.66	3.0	41.70	1.1	0.93	0.0	
EMBOLECTOMY, FEMOROPOPLITEA	852	2.33	0.3	35.48	4.2	0.02	0.0	5.88	0.7	
REPAIR ABDOMINAL ANEURYSM	2,275	0.00	0.0	50.64	2.2	0.00	0.0	1.08	0.0	
CAROTID ENDARTERECTOMY	1,556	0.00	0.0	3.88	0.2	2.85	0.2	3.27	0.2	
BYPASS GRAFT, LEG	1,765	7.17	0.4	79.37	4.5	0.00	0.0	6.49	0.4	
CHOLECYSTECTOMY	909	1.29	0.1	13.26	1.5	0.00	0.0	9.33	1.0	
EXPLORATORY LAPAROTOMY	642	8.63	1.3	9.11	1.4	0.69	0.1	13.43	2.1	
INGUINAL HERNIA REPAIR	559	5.39	1.0	0.45	0.1	0.00	0.0	2.21	0.4	
VENTRAL HERNIA REPAIR	691	0.69	0.1	6.74	1.0	0.00	0.0	2.19	0.3	
RENAL TRANSPLANTATION	2,219	129.66	5.8	67.88	3.1	1.61	0.1	1.56	0.1	
TURP	1,078	4.65	0.4	17.41	1.6	1.32	0.1	5.37	0.5	
TOTAL HYSTERECTOMY	971	7.51	0.8	46.78	4.8	2.60	0.3	15.50	1.6	
VAGINAL HYSTERECTOMY	984	4.39	0.4	41.49	4.2	0.17	0.0	7.69	0.8	
LAMINECTOMY	1,744	66.84	3.8	45.91	2.6	0.00	0.0	2.17	0.1	
LAMINOTOMY	1,555	7.07	0.5	17.82	1.1	0.00	0.0	1.47	0.1	
CARPAL TUNNEL REPAIR	495	4.93	1.0	20.23	4.1	0.00	0.0	0.00	0.0	
CATARACT EXTRACTION	1,676	5.64	0.3	6.48	0.4	0.00	0.0	0.00	0.0	
INTRACULAR LENS INSERTION	1,116	36.97	3.3	26.09	2.3	0.00	0.0	0.00	0.0	
PTCA	1,356	1.62	0.1	48.67	3.6	25.48	1.9	121.15	8.9	
SUPRAPUBIC PROSTATECTOMY	1,133	40.14	3.5	31.18	2.8	6.69	0.6	0.65	0.1	
D AND C OF UTERUS	253	0.00	0.0	0.72	0.3	0.91	0.4	4.14	1.6	
ENTEROLYSIS	820	13.94	1.7	62.03	7.6	5.65	0.7	2.55	0.3	
ENTERECTOMY	1,046	22.81	2.2	93.64	8.9	3.58	0.3	8.80	0.8	
COLECTOMY	1,263	18.87	1.5	47.03	3.7	2.24	0.2	12.99	1.0	
TOTAL	1,444	6.58	0.5	20.15	1.4	2.63	0.2	4.47	0.3	

Source: 1986 5% BMAD Beneficiary File.

TABLE 4-14

ADDITIONAL PROCEDURES ON THE SAME DAY OF SURGERY AS THE INDEX PROCEDURE,
USUALLY BILLED AS PART OF THE GLOBAL PACKAGE, 1989

Index procedure	Therapeutic Procedures					Diagnostic Procedures				
	Usually Included In Global Fee		Not Usually Included In Global Fee		As percent of primary surgeon's allowed charge	Usually Included In Global Fee		Not Usually Included In Global Fee		As percent of primary surgeon's allowed charge
	Mean allow charge for primary surgeon claim	Total mean allow charges per case	Total mean allow charges per case	As percent of primary surgeon's allowed charge		Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	
MASTECTOMY	\$ 1,064	\$ 0.82	0.1%	\$ 1.82	0.2%	\$ 21.28	2.0%	\$ 0.48	0.0%	
HIP REPLACEMENT	2,308	2.57	0.1	22.07	1.0	0.00	0.0	0.00	0.0	
REPAIR OF FEMORAL FRACTURE	1,275	0.00	0.0	4.77	0.4	0.00	0.0	0.00	0.0	
KNEE ARTHROPLASTY	2,345	4.98	0.2	19.52	0.8	0.00	0.0	0.43	0.0	
LEG OR THIGH AMPUTATION	835	0.33	0.0	5.74	0.7	0.00	0.0	1.32	0.2	
KNEE ARTHROSCOPY	1,112	118.42	10.7	6.95	0.6	5.97	0.5	0.00	0.0	
LUNG LOBECTOMY	1,788	19.09	1.1	1.03	0.1	33.83	1.9	84.95	4.8	
PERMANENT PACEMAKER INSERTION	1,163	10.04	0.9	17.62	1.5	0.00	0.0	6.29	0.5	
A/M VALVE	3,355	6.45	0.2	405.98	12.1	0.00	0.0	16.11	0.5	
CABG	4,128	8.45	0.2	158.41	3.8	42.31	1.0	1.98	0.0	
EMBOLECTOMY, FEMOROPOLITEAL	932	6.72	0.7	36.53	3.9	0.00	0.0	0.58	0.1	
REPAIR ABDOMINAL ANEURYSM	2,486	0.00	0.0	74.19	3.0	0.00	0.0	2.20	0.1	
CAROTID ENDARTERECTOMY	1,722	0.00	0.0	6.39	0.4	2.71	0.2	3.22	0.2	
BYPASS GRAFT, LEG	1,981	5.42	0.3	124.14	6.3	0.00	0.0	8.23	0.4	
CHOLECYSTECTOMY	980	0.00	0.0	13.25	1.4	0.00	0.0	16.08	1.6	
EXPLORATORY LAPAROTOMY	703	25.23	3.6	22.49	3.2	1.85	0.3	20.11	2.9	
INGUINAL HERNIA REPAIR	599	7.42	1.2	1.02	0.2	0.00	0.0	2.78	0.5	
VENTRAL HERNIA REPAIR	748	2.48	0.3	11.26	1.5	0.00	0.0	3.63	0.5	
RENAL TRANSPLANTATION	2,463	145.55	5.9	84.90	3.4	2.59	0.1	1.88	0.1	
TURP	1,126	6.37	0.6	21.72	1.9	0.92	0.1	7.11	0.6	
TOTAL HYSTERECTOMY	1,025	9.51	0.9	74.70	7.3	7.09	0.7	20.45	2.0	
VAGINAL HYSTERECTOMY	1,067	8.85	0.8	85.00	8.0	0.20	0.0	14.57	1.4	
LAMINECTOMY	1,934	62.91	3.3	98.57	5.1	0.00	0.0	1.41	0.1	
LAMINOTOMY	1,730	10.24	0.6	70.16	4.1	0.00	0.0			
CARPAL TUNNEL REPAIR	496	6.08	1.2	23.70	4.8	0.00	0.0	0.00	0.0	
CATARACT EXTRACTION	1,564	5.98	0.4	12.08	0.8	0.00	0.0	0.00	0.0	
INTRAOCULAR LENS INSERTION	1,057	52.16	4.9	52.70	5.0	0.00	0.0	0.00	0.0	
PTCA	1,491	0.00	0.0	35.36	2.4	16.29	1.1	160.56	10.8	
SUPRAPUBIC PROSTATECTOMY	1,212	23.62	1.9	53.07	4.4	9.37	0.8	0.00	0.0	
D AND C OF UTERUS	260	0.00	0.0	0.77	0.3	1.42	0.5	10.43	4.0	
ENTEROLYSIS	891	19.25	2.2	81.42	9.1	7.49	0.8	6.81	0.8	
ENTERECTOMY	1,095	27.89	2.5	134.05	12.2	10.09	0.9	14.67	1.3	
COLECTOMY	1,362	23.72	1.7	62.72	4.6	3.58	0.3	16.53	1.2	
TOTAL	1,503	8.18	0.5	29.52	2.0	3.40	0.2	8.55	0.6	

Source: 1989 5% BMAD Beneficiary File.

TABLE 4-15

ADDITIONAL PROCEDURES ON THE SAME DAY OF SURGERY AS THE INDEX PROCEDURE, USUALLY BILLED AS PART OF THE GLOBAL PACKAGE, BY BENEFICIARY AND FACILITY CHARACTERISTICS, 1989

Beneficiary Characteristics	Therapeutic Procedures				Diagnostic Procedures				
	Usually Included In Global Fee		Not Usually Included In Global Fee		Usually Included In Global Fee		Not Usually Included In Global Fee		
	Mean allow charge for primary surgeon claim	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge
TOTAL (a)	\$1,503	\$8.18	0.5	\$29.52	2.0	\$3.40	0.2	\$8.55	0.6
AGE									
LESS THAN 65	1,546	12.84	0.8	39.40	2.5	3.83	0.2	14.56	0.9
65-74	1,547	8.63	0.6	32.60	2.1	4.32	0.3	10.67	0.7
75-84	1,483	7.35	0.5	27.37	1.8	2.92	0.2	6.74	0.5
85 AND OVER	1,375	7.24	0.5	20.37	1.5	1.14	0.1	3.69	0.3
SEX									
UNKNOWN	1,546	0.92	0.1	23.58	1.5	0.00	0.0	16.58	1.1
MALE	1,531	8.54	0.6	32.89	2.1	3.87	0.3	10.83	0.7
FEMALE	1,481	7.90	0.5	26.90	1.8	3.03	0.2	6.77	0.5
RACE									
UNKNOWN	1,566	6.64	0.4	39.61	2.5	2.43	0.2	9.40	0.6
WHITE	1,504	8.01	0.5	29.12	1.9	3.48	0.2	8.67	0.6
BLACK	1,450	10.75	0.7	33.17	2.3	1.88	0.1	5.77	0.4
OTHER	1,601	8.57	0.5	33.02	2.1	5.23	0.3	11.69	0.7
DIVISION									
NEW ENGLAND	1,446	4.15	0.3	18.55	1.3	2.25	0.2	6.76	0.5
MIDDLE ATLANTIC	1,611	12.12	0.8	30.14	1.9	2.42	0.2	4.38	0.3
SOUTH ATLANTIC	1,464	8.35	0.6	28.92	2.0	2.96	0.2	9.50	0.6
EAST NORTH CENTRAL	1,512	7.72	0.5	31.39	2.1	3.41	0.2	8.63	0.6
EAST SOUTH CENTRAL	1,320	7.44	0.6	22.65	1.7	3.19	0.2	5.74	0.4
WEST NORTH CENTRAL	1,246	6.34	0.5	22.62	1.8	3.32	0.3	9.66	0.8
WEST SOUTH CENTRAL	1,542	8.65	0.6	35.14	2.3	4.54	0.3	9.59	0.6
MOUNTAIN	1,438	7.44	0.5	32.55	2.3	5.95	0.4	17.35	1.2
PACIFIC	1,700	6.70	0.4	33.77	2.0	4.07	0.2	10.09	0.6
SPECIALTY									
GENERAL SURGERY	1,116	9.54	0.9	33.10	3.0	3.67	0.3	8.57	0.8
CARDIOVASCULAR DISEASE	1,733	5.85	0.3	49.33	2.8	12.99	0.7	95.56	5.5
OBSTETRICS/GYNECOLOGY	658	6.73	1.0	40.26	6.1	3.51	0.5	15.46	2.3
NEUROLOGICAL SURGERY	1,498	22.57	1.5	44.97	3.0	0.00	0.0	0.97	0.1
OPHTHALMOLOGY	1,564	7.08	0.5	12.98	0.8	0.00	0.0	0.00	0.0
ORTHOPEDIC SURGERY	1,644	10.59	0.6	16.06	1.0	0.42	0.0	0.14	0.0
THORACIC SURGERY	2,838	6.87	0.2	119.01	4.2	22.90	0.8	9.94	0.4
UROLOGY	1,135	6.83	0.6	22.64	2.0	1.07	0.1	6.99	0.6
OTHER	1,276	6.64	0.5	28.30	2.2	3.80	0.3	20.04	1.6
Facility Characteristics									
TOTAL	\$1,588	\$7.48	0.5	\$43.17	2.7	\$5.86	0.4	\$14.37	0.9
BED SIZE									
LESS THAN 100	1,140	7.23	0.6	26.30	2.3	3.21	0.3	7.61	0.7
100-199	1,387	7.19	0.5	32.13	2.3	3.57	0.3	10.61	0.8
200-299	1,534	6.87	0.4	37.87	2.5	6.26	0.4	13.85	0.9
300-399	1,650	7.27	0.4	47.60	2.9	6.40	0.4	15.79	1.0
400-499	1,708	6.76	0.4	52.59	3.1	7.98	0.5	19.91	1.2
500 AND OVER	1,937	9.16	0.5	58.63	3.0	7.15	0.4	17.39	0.9
OWNERSHIP									
PUBLIC, NOT FOR PROFIT	1,432	6.98	0.5	38.42	2.7	3.75	0.3	12.26	0.9
PRIVATE, NOT FOR PROFIT	1,611	7.28	0.5	43.33	2.7	5.88	0.4	14.15	0.9
PRIVATE, FOR PROFIT	1,594	9.51	0.6	47.23	3.0	8.06	0.5	18.36	1.2
TEACHING STATUS									
NON-TEACHING HOSPITAL	1,446	7.55	0.5	37.28	2.6	5.50	0.4	14.41	1.0
TEACHING HOSPITAL	1,764	7.40	0.4	50.41	2.9	6.31	0.4	14.32	0.8

Source: 1989 5% BMAD Beneficiary file.

(a) Beneficiary totals and facility totals differ because it was not possible to merge facility-level data to all episodes.

TABLE 4-16
TOTAL ALLOWED CHARGES FOR PROCEDURES USUALLY BILLED AS PART OF THE GLOBAL PACKAGE, BY BENEFICIARY AND FACILITY CHARACTERISTICS, 1989

Beneficiary Characteristics	Therapeutic			Diagnostic	
	Total allowed charges for primary surgeon	Total allowed charges	As percent of primary surgeon's total allowed charges	Total allowed charges	As percent of primary surgeon's total allowed charges
TOTAL (a)	\$ 3,921,389,680	\$ 21,345,700	0.5%	\$ 8,864,780	0.2%
AGE					
LESS THAN 65	193,872,140	1,610,020	0.8	479,820	0.2
65-74	1,827,703,940	10,198,800	0.8	5,110,300	0.3
75-84	1,492,704,380	7,392,540	0.5	2,935,680	0.2
85 AND OVER	407,109,200	2,144,360	0.5	338,960	0.1
SEX					
UNKNOWN	742,160	440	0.1	0	0.0
MALE	1,747,198,680	9,749,940	0.8	4,421,720	0.3
FEMALE	2,173,448,800	11,595,340	0.5	4,443,040	0.2
RACE					
UNKNOWN	34,730,420	147,200	0.4	53,820	0.2
WHITE	3,582,219,380	19,085,060	0.5	8,279,520	0.2
BLACK	234,869,800	1,741,060	0.7	304,020	0.1
OTHER	69,570,060	372,360	0.5	227,400	0.3
DIVISION					
NEW ENGLAND	187,581,520	538,760	0.3	292,360	0.2
MIDDLE ATLANTIC	647,977,080	4,875,440	0.8	974,980	0.2
SOUTH ATLANTIC	719,277,320	4,103,800	0.6	1,455,360	0.2
EAST NORTH CENTRAL	739,370,400	3,773,860	0.5	1,666,960	0.2
EAST SOUTH CENTRAL	237,415,140	1,337,140	0.6	572,800	0.2
WEST NORTH CENTRAL	268,469,160	1,356,880	0.5	709,700	0.3
WEST SOUTH CENTRAL	450,548,860	2,528,160	0.6	1,326,500	0.3
MOUNTAIN	145,688,560	753,420	0.5	603,280	0.4
PACIFIC	527,061,620	2,078,260	0.4	1,262,840	0.2
SPECIALTY					
GENERAL SURGERY	609,674,900	5,213,160	0.9	2,003,780	0.3
CARDIOVASCULAR DISEASE	184,011,780	621,140	0.3	1,379,580	0.7
OBSTETRICS/GYNECOLOGY	50,981,000	521,500	1.0	271,780	0.5
NEUROLOGICAL SURGERY	47,442,300	714,500	1.5	0	0.0
OPHTHALMOLOGY	1,452,294,140	6,576,000	0.5	0	0.0
ORTHOPEDIC SURGERY	628,667,740	4,049,520	0.6	159,760	0.0
THORACIC SURGERY	530,062,080	1,284,220	0.2	4,277,520	0.8
UROLOGY	232,940,620	1,400,840	0.6	220,020	0.1
OTHER	185,315,100	964,820	0.5	552,320	0.3
Facility Characteristics					
TOTAL	\$ 2,134,629,340	\$ 10,056,720	0.5%	\$ 7,878,820	0.4%
BED SIZE					
LESS THAN 100	152,027,800	964,220	0.6	428,000	0.3
100-199	345,687,700	1,792,780	0.5	888,940	0.3
200-299	479,859,740	2,150,240	0.4	1,959,060	0.4
300-399	362,015,680	1,595,940	0.4	1,403,400	0.4
400-499	268,762,300	1,064,220	0.4	1,256,020	0.5
500 AND OVER	526,276,100	2,489,320	0.5	1,943,380	0.4
OWNERSHIP					
PUBLIC, NOT FOR PROFIT	226,922,900	1,105,760	0.5	594,720	0.3
PRIVATE, NOT FOR PROFIT	1,680,066,600	7,592,760	0.5	6,133,080	0.4
PRIVATE, FOR PROFIT	227,639,840	1,358,200	0.6	1,151,020	0.5
TEACHING STATUS					
NON-TEACHING HOSPITAL	1,071,912,080	5,598,260	0.5	4,074,000	0.4
TEACHING HOSPITAL	1,062,717,280	4,458,460	0.4	3,804,820	0.4

Source: 1989 5% BMAD Beneficiary File.

(a) Beneficiary totals and facility totals differ because it was not possible to merge facility-level data to all episodes.

TABLE 4-17

RELATIVE WORK UNITS FOR PROCEDURES USUALLY BILLED AS PART OF THE GLOBAL PACKAGE, 1989

Index Procedure	Mean Relative Work Units for Index Procedure	Therapeutic		Diagnostic	
		Mean Relative Work Units Per Episode	As Percent of Index	Mean Relative Work Units Per Episode	As Percent of Index
MASTECTOMY	13.09	0.0144	0.1	0.0584	0.4
HIP REPLACEMENT	18.78	0.0043	0.0	0.0000	0.0
FEMORAL FRACTURE	14.87	0.0000	0.0	0.0000	0.0
KNEE ARTHROPLASTY	20.63	0.0596	0.3	0.0000	0.0
LEG OR THIGH AMPUTATION	10.93	0.0072	0.1	0.0000	0.0
KNEE ARTHROSCOPY	7.99	0.4641	5.8	0.0067	0.1
LUNG LOBECTOMY	18.50	0.2023	1.1	0.0728	0.4
PERMANENT PACEMAKER INSERTION	7.55	0.0929	1.2	0.0000	0.0
A/M VALVE	25.99	0.0177	0.1	0.0000	0.0
CABG	26.89	0.0075	0.0	0.2924	1.1
EMBOLECTOMY, FEMOROPOLITEAL	9.75	0.0379	0.4	0.0000	0.0
REPAIR ABDOMINAL ANEURYSM	24.15	0.0000	0.0	0.0000	0.0
CAROTID ENDARTERECTOMY	17.07	0.0000	0.0	0.0160	0.1
BYPASS GRAFT, LEG	17.28	0.0225	0.1	0.0000	0.0
CHOLECYSTECTOMY	11.14	0.0000	0.0	0.0000	0.0
EXPLORATORY LAPAROTOMY	9.47	0.0110	0.1	0.0165	0.2
INGUINAL HERNIA REPAIR	5.53	0.0264	0.5	0.0000	0.0
VENTRAL HERNIA REPAIR	8.18	0.0021	0.0	0.0000	0.0
RENAL TRANSPLANTATION	26.63	2.2472	8.4	0.1476	0.6
TURP	12.13	0.1444	1.2	0.0216	0.2
TOTAL HYSTERECTOMY	13.74	0.0000	0.0	0.0054	0.0
VAGINAL HYSTERECTOMY	17.98	0.0297	0.2	0.0036	0.0
LAMINECTOMY	16.57	0.3380	2.0	0.0000	0.0
LAMINOTOMY	12.46	0.0226	0.2	0.0000	0.0
CARPAL TUNNEL REPAIR	4.20	0.0960	2.3	0.0000	0.0
CATARACT EXTRACTION	10.20	0.0418	0.4	0.0000	0.0
INTRAOCULAR LENS INSERTION	8.32	0.0975	1.2	0.0000	0.0
PTCA	10.10	0.0000	0.0	0.1041	1.0
SUPRAPUBIC PROSTATECTOMY	13.69	0.1659	1.2	0.2183	1.6
D AND C OF UTERUS	2.58	0.0000	0.0	0.0348	1.3
ENTEROLYSIS	10.68	0.2168	2.0	0.0000	0.0
ENTERECTOMY	13.87	0.0415	0.3	0.0000	0.0
COLECTOMY	15.78	0.0012	0.0	0.0000	0.0
TOTAL	12.36	0.0506	0.4	0.0203	0.2

Source: 1989 5% BMAD Beneficiary File.

TABLE 4-18

TOTAL ALLOWED CHARGES FOR PROCEDURES USUALLY PERFORMED THROUGH THE SAME SURGICAL INCISION AS THE INDEX PROCEDURE, THERAPEUTIC AND DIAGNOSTIC, 1986

Index procedure	Therapeutic		Diagnostic		
	Total allowed charges for primary surgeons	Total allowed charges	As percent of primary surgeon's total allowed charges	Total allowed charges	As percent of primary surgeon's total allowed charges
MASTECTOMY	\$ 41,828,640	\$ 31,060	0.1%	\$ 0	0.0%
HIP REPLACEMENT	167,050,380	724,820	0.4	0	0.0
REPAIR OF FEMORAL FRACTURE	171,549,200	0	0.0	0	0.0
KNEE ARTHROPLASTY	117,270,120	591,880	0.5	0	0.0
LEG OR THIGH AMPUTATION	30,236,960	13,080	0.0	0	0.0
KNEE ARTHROSCOPY	14,701,380	1,068,200	7.3	120,400	0.8
LUNG LOBECTOMY	21,437,340	152,380	0.7	161,540	0.8
PERMANENT PACEMAKER	70,036,760	527,160	0.8	0	0.0
AORTIC OR MITRAL VALVE REPLACEMENT	33,608,160	4,319,320	12.9	0	0.0
CABG	314,387,920	6,848,680	2.2	0	0.0
EMBOLECTOMY, FEMOROPopliteal	11,380,980	262,640	2.3	0	0.0
REPAIR ABDOMINAL ANEURYSM	59,275,880	676,560	1.1	0	0.0
CAROTID ENDARTERECTOMY	74,943,560	180,620	0.2	137,420	0.2
BYPASS GRAFT, LEG	59,988,040	1,038,800	1.7	217,820	0.4
CHOLECYSTECTOMY	109,750,520	1,368,780	1.2	711,240	0.6
EXPLORATORY LAPAROTOMY	12,759,420	297,720	2.3	99,120	0.8
INGUINAL HERNIA REPAIR	58,881,680	305,940	0.5	0	0.0
VENTRAL HERNIA REPAIR	16,747,580	179,980	1.1	4,000	0.0
RENAL TRANSPLANTATION	11,538,740	697,220	6.0	8,360	0.1
TURP	232,419,200	1,864,380	0.8	1,378,080	0.6
TOTAL HYSTERECTOMY	24,710,780	886,400	3.6	196,340	0.8
VAGINAL HYSTERECTOMY	16,728,780	20,500	0.1	46,980	0.3
LAMINECTOMY	20,127,960	1,202,320	6.0	0	0.0
LAMINOTOMY	30,221,800	483,780	1.6	0	0.0
CARPAL TUNNEL REPAIR	19,037,940	544,020	2.9	0	0.0
CATARACT EXTRACTION	1,317,473,020	7,307,980	0.6	0	0.0
INTRAOCULAR LENS INSERTION	36,821,640	1,199,400	3.3	0	0.0
PTCA	38,685,360	417,060	1.1	3,770,480	9.7
SUPRAPUBIC PROSTATECTOMY	7,706,040	424,060	5.5	0	0.0
D AND C OF UTERUS	11,695,220	0	0.0	0	0.0
ENTEROLYSIS	11,558,080	781,960	6.8	107,840	0.9
ENTERECTOMY	18,435,740	1,667,280	9.0	63,020	0.3
COLECTOMY	119,167,120	5,693,440	4.8	456,260	0.4
TOTAL	3,302,161,900	41,731,280	1.3	7,524,980	0.2

Source: 1986 5% BMAD Beneficiary File.

TABLE 4-19

TOTAL ALLOWED CHARGES FOR PROCEDURES USUALLY PERFORMED THROUGH THE SAME SURGICAL INCISION AS THE INDEX PROCEDURE, THERAPEUTIC AND DIAGNOSTIC, 1989

Index procedure	Total allowed charges for primary surgeons	Therapeutic		Diagnostic	
		Total allowed charges	As percent of primary surgeon's total allowed charges	Total allowed charges	As percent of primary surgeon's total allowed charges
MASTECTOMY	\$ 50,242,320	\$ 85,940	0.1%	\$ 0	0.0%
HIP REPLACEMENT	213,045,640	1,116,620	0.5	0	0.0
REPAIR OF FEMORAL FRACTURE	201,721,940	0	0.0	0	0.0
KNEE ARTHROPLASTY	173,044,340	1,785,460	1.0	0	0.0
LEG OR THIGH AMPUTATION	34,889,620	19,600	0.1	0	0.0
KNEE ARTHROSCOPY	29,754,780	3,169,040	10.7	155,780	0.5
LUNG LOBECTOMY	24,564,760	262,300	1.1	464,840	1.9
PERMANENT PACEMAKER INSERTION	80,377,140	1,019,980	1.3	0	0.0
AORTIC OR MITRAL VALVE REPLACEMENT	49,317,700	5,563,480	11.3	0	0.0
CABG	453,770,380	12,953,000	2.9	0	0.0
EMBOLECTOMY, FEMOROPopliteal	10,322,040	223,320	2.2	0	0.0
REPAIR ABDOMINAL ANEURYSM	72,935,720	993,420	1.4	0	0.0
CAROTID ENDARTERECTOMY	73,301,560	222,960	0.3	115,340	0.2
BYPASS GRAFT, LEG	67,052,820	1,703,960	2.5	266,800	0.4
CHOLECYSTECTOMY	116,936,140	1,196,180	1.0	1,382,100	1.2
EXPLORATORY LAPAROTOMY	12,796,640	754,180	5.9	143,040	1.1
INGUINAL HERNIA REPAIR	69,465,580	573,960	0.8	0	0.0
VENTRAL HERNIA REPAIR	21,732,780	378,280	1.7	8,100	0.0
RENAL TRANSPLANTATION	13,447,620	794,700	5.9	14,140	0.1
TURP	234,360,020	2,435,720	1.0	1,583,380	0.7
TOTAL HYSTERECTOMY	26,722,700	1,609,360	6.0	415,500	1.6
VAGINAL HYSTERECTOMY	17,946,600	9,060	0.1	183,180	1.0
LAMINECTOMY	22,320,440	1,716,840	7.7	0	0.0
LAMINOTOMY	38,341,260	1,685,860	4.4	0	0.0
CARPAL TUNNEL REPAIR	25,711,680	919,160	3.6	0	0.0
CATARACT EXTRACTION	1,458,001,840	13,557,660	0.9	0	0.0
INTRAOCULAR LENS INSERTION	21,687,620	1,074,160	5.0	0	0.0
PTCA	111,731,100	999,860	0.9	12,071,200	10.8
SUPRAPUBIC PROSTATECTOMY	5,549,700	286,600	5.2	0	0.0
D AND C OF UTERUS	12,086,180	0	0.0	0	0.0
ENTEROLYSIS	18,001,500	1,591,000	8.8	260,700	1.4
ENTERECTOMY	21,120,500	2,535,920	12.0	194,540	0.9
COLECTOMY	139,088,980	7,980,680	5.7	684,320	0.5
TOTAL	3,921,389,660	69,218,300	1.8	17,942,940	0.5

Source: 1989 5% BMAD Beneficiary File.

TABLE 4-20

MEAN ALLOWED CHARGES FOR PROCEDURES USUALLY PERFORMED THROUGH THE SAME SURGICAL INCISION AS THE INDEX PROCEDURE, THERAPEUTIC AND DIAGNOSTIC, 1986

Index procedure	Therapeutic Procedures					Diagnostic Procedures				
	Usually Performed Through Same Incision			Not Usually Performed Through Same Incision		Usually Performed Through Same Incision			Not Usually Performed Through Same Incision	
	Mean allow charge for primary surgeon claim	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	
MASTECTOMY	\$ 989	\$ 0.73	0.1%	\$ 1.14	0.1%	\$ 0.00	0.0%	\$ 16.84	1.7%	
HIP REPLACEMENT	2,232	9.68	0.4	9.94	0.4	0.00	0.0	0.00	0.0	
REPAIR OF FEMORAL FRACTURE	1,198	0.00	0.0	3.95	0.3	0.00	0.0	0.00	0.0	
KNEE ARTHROPLASTY	2,297	11.59	0.5	0.85	0.0	0.00	0.0	0.29	0.0	
LEG OR THIGH AMPUTATION	780	0.33	0.0	3.55	0.5	0.00	0.0	0.22	0.0	
KNEE ARTHROSCOPY	972	70.65	7.3	4.98	0.5	7.96	0.8	0.07	0.0	
LUNG LOBECTOMY	1,605	11.41	0.7	1.94	0.1	12.09	0.8	52.60	3.3	
PERMANENT PACEMAKER INSERTION	1,086	8.17	0.8	9.27	0.9	0.00	0.0	3.44	0.3	
AVM VALVE	3,083	396.27	12.9	21.57	0.7	0.00	0.0	18.44	0.6	
CABG	3,916	85.31	2.2	36.73	0.9	0.00	0.0	42.63	1.1	
EMBOLECTOMY, FEMOROPOLITEAL	852	19.66	2.3	18.15	2.1	0.00	0.0	5.90	0.7	
REPAIR ABDOMINAL ANEURYSM	2,275	25.96	1.1	24.68	1.1	0.00	0.0	1.08	0.0	
CAROTID ENDARTERECTOMY	1,556	3.75	0.2	0.12	0.0	2.85	0.2	3.27	0.2	
BYPASS GRAFT, LEG	1,765	30.57	1.7	55.97	3.2	6.41	0.4	0.08	0.0	
CHOLECYSTECTOMY	909	11.33	1.2	3.21	0.4	5.89	0.6	3.44	0.4	
EXPLORATORY LAPAROTOMY	642	14.99	2.3	2.75	0.4	4.99	0.8	9.14	1.4	
INGUINAL HERNIA REPAIR	559	2.90	0.5	2.94	0.5	0.00	0.0	2.21	0.4	
VENTRAL HERNIA REPAIR	691	7.43	1.1	0.00	0.0	0.17	0.0	2.02	0.3	
RENAL TRANSPLANTATION	2,219	134.08	6.0	63.46	2.9	1.61	0.1	1.56	0.1	
TURP	1,078	8.65	0.8	13.41	1.2	6.39	0.6	0.29	0.0	
TOTAL HYSTERECTOMY	971	34.82	3.6	19.47	2.0	7.71	0.8	10.38	1.1	
VAGINAL HYSTERECTOMY	984	1.21	0.1	44.68	4.5	2.76	0.3	5.10	0.5	
LAMINECTOMY	1,744	104.19	6.0	8.56	0.5	0.00	0.0	2.17	0.1	
LAMINOTOMY	1,555	24.89	1.6	0.00	0.0	0.00	0.0	1.47	0.1	
CARPAL TUNNEL REPAIR	495	14.15	2.9	11.01	2.2	0.00	0.0	0.00	0.0	
CATARACT EXTRACTION	1,676	9.29	0.6	2.83	0.2	0.00	0.0	0.00	0.0	
INTRACULAR LENS INSERTION	1,116	36.37	3.3	26.69	2.4	0.00	0.0	0.00	0.0	
PTCA	1,356	14.62	1.1	35.66	2.6	132.20	9.7	12.81	0.9	
SUPRAPUBIC PROSTATECTOMY	1,133	62.36	5.5	8.96	0.8	0.00	0.0	7.34	0.6	
D AND C OF UTERUS	253	0.00	0.0	0.72	0.3	0.00	0.0	5.05	2.0	
ENTEROLYSIS	820	55.46	6.8	20.51	2.5	7.65	0.9	0.55	0.1	
ENTERECTOMY	1,046	94.62	9.0	21.83	2.1	3.58	0.3	8.80	0.8	
COLECTOMY	1,263	60.32	4.8	5.57	0.4	4.83	0.4	10.39	0.8	
TOTAL	1,444	18.25	1.3	8.48	0.6	3.29	0.2	3.80	0.3	

Source: 1986 5% BMAD Beneficiary File.

TABLE 4-21

MEAN ALLOWED CHARGES FOR PROCEDURES USUALLY PERFORMED THROUGH THE SAME SURGICAL INCISION AS THE INDEX PROCEDURE, THERAPEUTIC AND DIAGNOSTIC, 1989

Index procedure	Therapeutic Procedures				Diagnostic Procedures				
	Usually Performed Through Same Incision		Not Usually Performed Through Same Incision		Usually Performed Through Same Incision		Not Usually Performed Through Same Incision		
	Mean allow charge for primary surgeon claim	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge	Total mean allow charges per case	As percent of primary surgeon's allowed charge
MASTECTOMY	\$ 1,064	\$ 1.82	0.2%	\$ 0.82	0.1%	\$ 0.00	0.0%	\$ 21.78	2.0%
HIP REPLACEMENT	2,308	12.10	0.5	12.53	0.5	0.00	0.0	0.00	0.0
REPAIR OF FEMORAL FRACTURE	1,275	0.00	0.0	4.77	0.4	0.00	0.0	0.00	0.0
KNEE ARTHROPLASTY	2,345	24.19	1.0	0.30	0.0	0.00	0.0	0.43	0.0
LEG OR THIGH AMPUTATION	835	0.47	0.1	5.59	0.7	0.00	0.0	1.32	0.2
KNEE ARTHROSCOPY	1,112	118.42	10.7	6.95	0.6	5.82	0.5	0.15	0.0
LUNG LOBECTOMY	1,788	19.03	1.1	1.03	0.1	33.83	1.9	84.95	4.8
PERMANENT PACEMAKER INSERTION	1,163	14.75	1.3	12.91	1.1	0.00	0.0	6.29	0.5
A/M VALVE	3,355	378.47	11.3	33.95	1.0	0.00	0.0	16.11	0.5
CABG	4,128	117.84	2.9	49.02	1.2	0.00	0.0	44.29	1.1
EMBOLECTOMY, FEMOROPOLITEAL	932	20.16	2.2	23.10	2.5	0.00	0.0	0.58	0.1
REPAIR ABDOMINAL ANEURYSM	2,488	33.86	1.4	40.33	1.6	0.00	0.0	2.20	0.1
CAROTID ENDARTERECTOMY	1,722	5.24	0.3	1.15	0.1	2.71	0.2	3.22	0.2
BYPASS GRAFT, LEG	1,981	50.35	2.5	79.20	4.0	7.88	0.4	0.34	0.0
CHOLECYSTECTOMY	980	10.02	1.0	3.23	0.3	11.58	1.2	4.50	0.5
EXPLORATORY LAPAROTOMY	703	41.44	5.9	6.28	0.9	7.86	1.1	14.09	2.0
INGUINAL HERNIA REPAIR	599	4.95	0.8	3.49	0.6	0.00	0.0	2.78	0.5
VENTRAL HERNIA REPAIR	748	13.03	1.7	0.71	0.1	0.28	0.0	3.35	0.4
RENAL TRANSPLANTATION	2,463	145.55	5.9	84.90	3.4	2.59	0.1	1.88	0.1
TURP	1,126	11.70	1.0	16.39	1.5	7.61	0.7	0.42	0.0
TOTAL HYSTERECTOMY	1,025	61.71	6.0	22.49	2.2	15.93	1.6	11.62	1.1
VAGINAL HYSTERECTOMY	1,067	0.54	0.1	93.31	8.7	10.89	1.0	3.88	0.4
LAMINECTOMY	1,934	148.77	7.7	12.71	0.7	0.00	0.0	1.41	0.1
LAMINOTOMY	1,730	76.08	4.4	4.32	0.2	0.00	0.0	1.55	0.1
CARPAL TUNNEL REPAIR	496	17.72	3.6	12.05	2.4	0.00	0.0	0.00	0.0
CATARACT EXTRACTION	1,564	14.54	0.9	3.52	0.2	0.00	0.0	0.00	0.0
INTRAOCULAR LENS INSERTION	1,057	52.35	5.0	52.52	5.0	0.00	0.0	0.00	0.0
PTCA	1,491	13.34	0.9	22.02	1.5	161.08	10.8	15.77	1.1
SUPRAPUBIC PROSTATECTOMY	1,212	62.58	5.2	14.11	1.2	0.00	0.0	9.37	0.8
D AND C OF UTERUS	260	0.00	0.0	0.77	0.3	0.00	0.0	11.85	4.6
ENTEROLYSIS	891	78.76	8.8	21.91	2.5	12.91	1.4	1.40	0.2
ENTERECTOMY	1,095	131.53	12.0	30.41	2.8	10.09	0.9	14.87	1.3
COLECTOMY	1,362	78.15	5.7	8.29	0.6	6.70	0.5	13.41	1.0
TOTAL	1,503	26.53	1.8	11.18	0.7	6.88	0.5	5.07	0.3

Source: 1989 5% BMAD Beneficiary File.

TABLE 4-22

MEAN ALLOWED CHARGES FOR PROCEDURES USUALLY PERFORMED THROUGH THE SAME SURGICAL INCISION AS THE INDEX PROCEDURE, THERAPEUTIC AND DIAGNOSTIC, BY BENEFICIARY AND FACILITY CHARACTERISTICS, 1989

Beneficiary Characteristics	Therapeutic Procedures					Diagnostic Procedures				
	Mean allow charge for primary surgeon claim	Usually Performed Through Same Incision		Not Usually Performed Through Same Incision		Mean allow charge for primary surgeon claim	Usually Performed Through Same Incision		Not Usually Performed Through Same Incision	
		Total mean allow charge per case	As percent of primary surgeon's allowed charge	Total mean allow charge per case	As percent of primary surgeon's allowed charge		Total mean allow charge per case	As percent of primary surgeon's allowed charge	Total mean allow charge per case	As percent of primary surgeon's allowed charge
TOTAL (a)	\$ 1,503	\$ 26.53	1.8%	\$ 11.18	0.7%	\$ 6.88	0.5%	\$ 5.07	0.3%	
AGE										
LESS THAN 65	1,546	32.70	2.1	19.54	1.3	11.48	0.7	6.91	0.4	
65-74	1,547	29.29	1.9	11.94	0.8	8.85	0.6	6.14	0.4	
75-84	1,483	24.58	1.7	10.13	0.7	5.32	0.4	4.34	0.3	
85 AND OVER	1,375	19.48	1.4	8.13	0.6	2.34	0.2	2.49	0.2	
SEX										
UNKNOWN	1,546	23.58	1.5	0.92	0.1	16.58	1.1	0.00	0.0	
MALE	1,531	27.92	1.8	13.52	0.9	8.97	0.6	5.73	0.4	
FEMALE	1,481	25.44	1.7	9.36	0.6	5.24	0.4	4.56	0.3	
RACE										
UNKNOWN	1,566	32.11	2.1	14.14	0.9	9.29	0.6	2.53	0.2	
WHITE	1,504	25.99	1.7	11.14	0.7	6.99	0.5	5.16	0.3	
BLACK	1,450	32.61	2.2	11.31	0.8	3.96	0.3	3.68	0.3	
OTHER	1,601	30.57	1.9	11.01	0.7	10.28	0.6	6.64	0.4	
DIVISION										
NEW ENGLAND	1,446	14.17	1.0	8.54	0.6	4.12	0.3	4.89	0.3	
MIDDLE ATLANTIC	1,611	30.61	1.9	11.65	0.7	3.49	0.2	3.31	0.2	
SOUTH ATLANTIC	1,464	27.06	1.8	10.21	0.7	6.71	0.5	5.75	0.4	
EAST NORTH CENTRAL	1,512	28.28	1.9	10.83	0.7	7.52	0.5	4.52	0.3	
EAST SOUTH CENTRAL	1,320	20.31	1.5	9.78	0.7	4.36	0.3	4.57	0.3	
WEST NORTH CENTRAL	1,246	20.48	1.6	8.49	0.7	8.30	0.7	4.68	0.4	
WEST SOUTH CENTRAL	1,542	28.05	1.8	15.74	1.0	7.32	0.5	6.81	0.4	
MOUNTAIN	1,438	26.82	1.9	13.16	0.9	16.65	1.2	6.65	0.5	
PACIFIC	1,700	29.03	1.7	11.45	0.7	8.53	0.5	5.63	0.3	
SPECIALTY										
GENERAL SURGERY	1,116	31.51	2.8	11.13	1.0	4.81	0.4	7.43	0.7	
CARDIOVASCULAR DISEASE	1,733	32.40	1.9	22.77	1.3	92.37	5.3	16.19	0.9	
OBSTETRICS/GYNECOLOGY	658	21.98	3.3	25.02	3.8	7.62	1.2	11.35	1.7	
NEUROLOGICAL SURGERY	1,498	62.82	4.2	4.72	0.3	0.00	0.0	0.97	0.1	
OPHTHALMOLOGY	1,564	15.41	1.0	4.66	0.3	0.00	0.0	0.00	0.0	
ORTHOPEDIC SURGERY	1,644	19.91	1.2	6.74	0.4	0.41	0.0	0.15	0.0	
THORACIC SURGERY	2,838	90.85	3.2	35.03	1.2	3.42	0.1	29.42	1.0	
UROLOGY	1,135	12.78	1.1	16.68	1.5	7.48	0.7	0.58	0.1	
OTHER	1,276	23.16	1.8	11.79	0.9	17.81	1.4	6.02	0.5	
Facility Characteristics										
TOTAL	\$ 1,588	\$34.39	2.2	\$16.26	1.0	\$11.75	0.7	\$8.49	0.5	
BED SIZE										
LESS THAN 100	1,140	22.03	1.9	11.51	1.0	5.99	0.5	4.83	0.4	
100-199	1,387	25.94	1.9	13.39	1.0	7.88	0.6	6.30	0.5	
200-299	1,534	28.31	1.8	16.44	1.1	11.49	0.7	8.63	0.6	
300-399	1,650	36.80	2.2	18.07	1.1	12.21	0.7	9.97	0.6	
400-499	1,708	41.42	2.4	17.93	1.0	17.61	1.0	10.28	0.6	
500 AND OVER	1,937	49.21	2.5	18.58	1.0	14.65	0.8	9.89	0.5	
OWNERSHIP										
PUBLIC, NOT FOR PROFIT	1,432	31.38	2.2	14.02	1.0	9.92	0.7	6.09	0.4	
PRIVATE, NOT FOR PROFIT	1,611	34.69	2.2	15.92	1.0	11.58	0.7	8.45	0.5	
PRIVATE, FOR PROFIT	1,594	35.54	2.2	21.20	1.3	14.96	0.9	11.46	0.7	
TEACHING STATUS										
NON-TEACHING HOSPITAL	1,446	29.49	2.0	15.35	1.1	11.47	0.8	8.44	0.6	
TEACHING HOSPITAL	1,764	40.43	2.3	17.38	1.0	12.09	0.7	8.54	0.5	

Source: 1989 5% BMAD Beneficiary File.

(a) Beneficiary totals and facility totals differ because it was not possible to merge facility-level data to all episodes.

TABLE 4-23

TOTAL ALLOWED CHARGES FOR PROCEDURES USUALLY PERFORMED THROUGH THE SAME SURGICAL INCISION AS THE INDEX PROCEDURE, THERAPEUTIC AND DIAGNOSTIC, BY BENEFICIARY AND FACILITY CHARACTERISTICS, 1989

Beneficiary Characteristics	Therapeutic			Diagnostic		
	Total allowed charges for primary surgeon	Total allowed charges	As percent of primary surgeon's total allowed charges	Total allowed charges	As percent of primary surgeon's total allowed charges	
TOTAL (a)	\$ 3,921,389,660	\$ 69,218,300	1.8%	\$ 17,942,940	0.5%	
AGE						
LESS THAN 65	193,872,140	4,101,160	2.1	1,439,260	0.7	
65-74	1,827,703,940	34,610,760	1.9	10,460,580	0.6	
75-84	1,492,704,380	24,738,260	1.7	5,351,060	0.4	
85 AND OVER	407,109,200	5,768,140	1.4	692,080	0.2	
SEX						
UNKNOWN	742,160	11,320	1.5	7,980	1.1	
MALE	1,747,198,680	31,864,120	1.8	10,237,100	0.6	
FEMALE	2,173,448,800	37,342,860	1.7	7,697,900	0.4	
RACE						
UNKNOWN	34,730,420	712,200	2.1	206,060	0.6	
WHITE	3,582,219,380	61,896,900	1.7	16,648,360	0.5	
BLACK	234,869,800	5,280,500	2.2	641,860	0.3	
OTHER	69,570,060	1,328,720	1.9	446,680	0.6	
DIVISION						
NEW ENGLAND	187,581,520	1,838,040	1.0	534,960	0.3	
MIDDLE ATLANTIC	647,977,080	12,312,000	1.9	1,404,260	0.2	
SOUTH ATLANTIC	719,277,320	13,299,280	1.8	3,298,080	0.5	
EAST NORTH CENTRAL	739,370,400	13,828,000	1.9	3,676,220	0.5	
EAST SOUTH CENTRAL	237,415,140	3,651,860	1.5	783,400	0.3	
WEST NORTH CENTRAL	268,469,160	4,378,840	1.6	1,775,120	0.7	
WEST SOUTH CENTRAL	450,548,860	8,195,820	1.8	2,138,720	0.5	
MOUNTAIN	145,688,560	2,717,880	1.9	1,687,260	1.2	
PACIFIC	527,061,620	8,996,600	1.7	2,644,920	0.5	
SPECIALTY						
GENERAL SURGERY	609,674,900	17,212,220	2.8	2,627,600	0.4	
CARDIOVASCULAR DISEASE	184,011,780	3,440,380	1.9	9,807,440	5.3	
OBSTETRICS/GYNECOLOGY	50,981,000	1,702,600	3.3	590,300	1.2	
NEUROLOGICAL SURGERY	47,442,300	1,988,820	4.2	0	0.0	
OPHTHALMOLOGY	1,452,294,140	14,304,820	1.0	0	0.0	
ORTHOPEDIC SURGERY	628,667,740	7,612,420	1.2	155,780	0.0	
THORACIC SURGERY	530,062,080	16,970,780	3.2	638,940	0.1	
UROLOGY	232,940,620	2,622,140	1.1	1,534,900	0.7	
OTHER	185,315,100	3,364,120	1.8	2,587,980	1.4	
Facility Characteristics						
TOTAL (a)	2,134,629,340	46,218,480	2.2	15,786,120	0.7	
BED SIZE						
LESS THAN 100	152,027,800	2,936,580	1.9	798,800	0.5	
100-199	345,687,700	6,463,380	1.9	1,963,020	0.6	
200-299	479,859,740	8,855,900	1.8	3,593,700	0.7	
300-399	362,015,680	8,072,760	2.2	2,679,200	0.7	
400-499	268,762,300	6,515,980	2.4	2,770,240	1.0	
500 AND OVER	526,276,100	13,373,880	2.5	3,981,160	0.8	
OWNERSHIP						
PUBLIC, NOT FOR PROFIT	226,922,900	4,971,400	2.2	1,572,120	0.7	
PRIVATE, NOT FOR PROFIT	1,680,066,600	36,172,420	2.2	12,077,860	0.7	
PRIVATE, FOR PROFIT	227,639,840	5,074,660	2.2	2,136,140	0.9	
TEACHING STATUS						
NON-TEACHING HOSPITAL	1,071,912,080	21,857,800	2.0	8,500,580	0.8	
TEACHING HOSPITAL	1,062,717,280	24,360,680	2.3	7,285,540	0.7	

Source: 1989 5% BMAD Beneficiary File.

(a) Beneficiary totals and facility totals differ because it was not possible to merge facility-level data to all episodes.

TABLE 4-24

RELATIVE WORK UNITS FOR PROCEDURES PERFORMED THROUGH THE SAME SURGICAL INCISION AS THE INDEX PROCEDURE, 1989

Index Procedure	Mean Relative Work Units for Index Procedure	Therapeutic		Diagnostic	
		Mean Relative Work Units Per Episode	As Percent of Index	Mean Relative Work Units Per Episode	As Percent of Index
MASTECTOMY	13.09	0.0148	0.1	0.0000	0.0
HIP REPLACEMENT	18.78	0.0464	0.2	0.0000	0.0
FEMORAL FRACTURE	14.87	0.0000	0.0	0.0000	0.0
KNEE ARTHROPLASTY	20.63	0.0962	0.5	0.0000	0.0
LEG OR THIGH AMPUTATION	10.93	0.0072	0.1	0.0000	0.0
KNEE ARTHROSCOPY	7.99	0.4641	5.8	0.0030	0.0
LUNG LOBECTOMY	18.50	0.2023	1.1	0.0728	0.4
PERMANENT PACEMAKER INSERTION	7.55	0.1362	1.8	0.0000	0.0
A/M VALVE	25.99	0.4476	1.7	0.0000	0.0
CABG	26.89	0.0287	0.1	0.0000	0.0
EMBOLECTOMY, FEMOROPopliteal	9.75	0.2310	2.4	0.0000	0.0
REPAIR ABDOMINAL ANEURYSM	24.15	0.0641	0.3	0.0000	0.0
CAROTID ENDARTERECTOMY	17.07	0.0376	0.2	0.0160	0.1
BYPASS GRAFT, LEG	17.28	0.0544	0.3	0.0798	0.5
CHOLECYSTECTOMY	11.14	0.0196	0.2	0.0050	0.0
EXPLORATORY LAPAROTOMY	9.47	0.0516	0.5	0.0176	0.2
INGUINAL HERNIA REPAIR	5.53	0.0264	0.5	0.0000	0.0
VENTRAL HERNIA REPAIR	8.18	0.0303	0.4	0.0000	0.0
RENAL TRANSPLANTATION	26.63	2.2472	8.4	0.1476	0.6
TURP	12.13	0.2237	1.8	0.1326	1.1
TOTAL HYSTERECTOMY	13.74	0.1242	0.9	0.1733	1.3
VAGINAL HYSTERECTOMY	17.98	0.0000	0.0	0.0000	0.0
LAMINECTOMY	16.57	0.9844	5.9	0.0000	0.0
LAMINOTOMY	12.46	0.0226	0.2	0.0000	0.0
CARPAL TUNNEL REPAIR	4.20	0.1936	4.6	0.0000	0.0
CATARACT EXTRACTION	10.20	0.0117	0.1	0.0000	0.0
INTRAOCULAR LENS INSERERTION	8.32	0.0838	1.0	0.0000	0.0
PTCA	10.10	0.0552	0.5	1.1577	11.5
SUPRAPUBIC PROSTATECTOMY	13.69	0.4105	3.0	0.0000	0.0
D AND C OF UTERUS	2.58	0.0000	0.0	0.0000	0.0
ENTEROLYSIS	10.68	0.3822	3.6	0.0317	0.3
ENTERECTOMY	13.87	0.0633	0.5	0.0000	0.0
COLECTOMY	15.78	0.0208	0.1	0.0006	0.0
TOTAL	12.36	0.0672	0.5	0.0482	0.4

Source: 1989 5% BMAD Beneficiary File.

APPENDIX A

INSTRUCTIONS TO SURGICAL CONSULTANTS

July 20, 1992

Dear Physician:

The Center for Health Economics Research is conducting a study of Medicare billing patterns for surgical services. In January 1992, Medicare will implement a physician fee schedule using a resource-based relative value scale (RBRVS). The purpose of our research is to understand the relationships between surgical services provided to a Medicare beneficiary during a single day. For example, to what extent do multiple surgical claims on the same day of service represent unrelated surgical services (as opposed to "unbundling" of related surgical services)? By comparing actual billing practices with those assumed by the relative value scale, our research will provide a measure of the accuracy of the relative value scale as the basis for Medicare's physician fee schedule.

At the beginning of our study, we identified several groups of surgical procedures as "index procedures", i.e., likely to be the principal surgical procedure for a beneficiary on a given day. Then, using a national data base of Medicare physicians' claims, we identified additional surgical services provided on the same day as these index procedures. We are asking your assistance in understanding the relationship between these additional procedures and the index procedure.

The attached sheet identifies a group of surgical services as an "index procedure". Assume that the index procedure represents the principal reason for surgery on a single day of service. Following the index procedure is a list of other surgical services. Assume that each of these procedures is performed on the same day as the index procedure. For each of these additional procedures, we would like you to tell us whether:

- 1) the procedure is usually performed by a surgeon (as opposed to an anesthesiologist);
- 2) the procedure is primarily therapeutic (as opposed to diagnostic);
- 3) the procedure is usually considered part of the same "global" package of surgical services as the index procedure;*
- 4) the procedure is usually performed through the same incision as the index procedure.

For each procedure listed on the following page, please circle the appropriate responses.

Thank you for your participation.

Sincerely,

Robert C. Boutwell, MD
Project Director

*A "global" package of surgical services includes all of the services which are normally required for successful completion of the procedure, in the absence of significant complications.

Index procedure – Coronary artery bypass graft surgery

CPT-4 Code	Description	Usually performed by a surgeon (instead of an anesthesiologist)	Primarily Therapeutic (Instead of Diagnostic)	Usually Included in Global Procedure	Usually Done Through Same Incision as Index Procedure
33210	Temporary pacemaker insertion	Yes No	Yes No	Yes No	Yes No
33405	Replacement, aortic valve, with cardiopulmonary bypass	Yes No	Yes No	Yes No	Yes No
33430	Replacement, mitral valve, with cardiopulmonary bypass	Yes No	Yes No	Yes No	Yes No
33542	Myocardial resection	Yes No	Yes No	Yes No	Yes No
33970	Intra-aortic balloon, insertion only	Yes No	Yes No	Yes No	Yes No
35301	Thromboendarterectomy, with or without patch graft; carotid, vertebral, subclavian, by neck incision	Yes No	Yes No	Yes No	Yes No
35820	Exploration for post-operative hemorrhage or thrombosis, chest	Yes No	Yes No	Yes No	Yes No
36010	Catheterization of superior or inferior vena cava, right heart, or pulmonary artery	Yes No	Yes No	Yes No	Yes No
36140	Introduction of needle or intracatheter, retrograde extremity artery	Yes No	Yes No	Yes No	Yes No
36489	Placement of central venous catheter, percutaneous	Yes No	Yes No	Yes No	Yes No
36620	Arterial catheterization, percutaneous	Yes No	Yes No	Yes No	Yes No
36625	Arterial catheterization, cutdown	Yes No	Yes No	Yes No	Yes No
92982	Percutaneous transluminal coronary angioplasty; single vessel	Yes No	Yes No	Yes No	Yes No
93501	Right heart catheterization	Yes No	Yes No	Yes No	Yes No
93503	Swan-Ganz catheterization	Yes No	Yes No	Yes No	Yes No

CPT-4 Code	Description	Usually performed by a surgeon (instead of an anesthesiologist)		Primarily Therapeutic (Instead of Diagnostic)		Usually Included in Global Procedure		Usually Done Through Same Incision as Index Procedure	
		Yes	No	Yes	No	Yes	No	Yes	No
93536	Percutaneous insertion of intra-aortic balloon								
93547	Combined left heart, coronary angiogram, left ventricular angiography	Yes	No	Yes	No	Yes	No	Yes	No
93549	Combined right and left heart, coronary angiogram, left ventricular angiogram	Yes	No	Yes	No	Yes	No	Yes	No

APPENDIX B

Key to Tables in Appendix B

1. The top left-hand corner of each table shows the index procedure group covered by the table. All data in Appendix B is derived from the 1989 5 percent BMAD Beneficiary File; data shown are actual counts of claims from the 5 percent file, rather than estimates of full claims volume.
2. Procedure codes which accounted for at least 1 percent of "secondary" surgical claims* in either 1986 or 1989 are listed along the left-hand margin of each table.
3. The total number of claims for each procedure code is shown along the right-hand margin of each table.
4. Our surgical consultants classified each of these procedure codes as
 - o therapeutic or diagnostic;
 - o performed through the same or a different incision as the index procedure; and
 - o usually considered to be part of the global package of services reimbursed under the index procedure, or usually reimbursed separately.

In the tables of Appendix B, the columns in which data appear reflect the responses of our consultants to each of these dichotomous questions for each procedure code. That is, the total volume of claims in the right-hand column for a procedure code is also shown in either the "therapeutic" or "diagnostic" column; in the "same incision" or "different incision" column; and in the "usually global" or "not global" column.

*"Secondary" surgical claims are those with the same beneficiary identifier and date of service as the index procedure, but with a procedure code falling outside the range included in the index procedure group; that is, a same-day procedure that is not a claim for an assistant surgeon.

APPENDIX B

MASTECTOMY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
11401	0	0.00	5	1.66	0	0.00	5	1.62	0	0.00	5	23.81	5	1.58
11402	0	0.00	1	0.33	0	0.00	1	0.32	0	0.00	1	4.76	1	0.32
11403	0	0.00	2	0.66	0	0.00	2	0.65	0	0.00	2	9.52	2	0.63
11404	0	0.00	1	0.33	0	0.00	1	0.32	0	0.00	1	4.76	1	0.32
11406	0	0.00	1	0.33	0	0.00	1	0.32	0	0.00	1	4.76	1	0.32
11421	0	0.00	1	0.33	0	0.00	1	0.32	0	0.00	1	4.76	1	0.32
11426	0	0.00	1	0.33	0	0.00	1	0.32	0	0.00	1	4.76	1	0.32
11443	0	0.00	1	0.33	0	0.00	1	0.32	0	0.00	1	4.76	1	0.32
11444	0	0.00	1	0.33	0	0.00	1	0.32	0	0.00	1	4.76	1	0.32
15100	5	33.33	0	0.00	0	0.00	5	1.62	5	1.69	0	0.00	5	1.58
15101	3	20.00	0	0.00	0	0.00	3	0.97	3	1.02	0	0.00	3	0.95
19100	0	0.00	16	5.32	0	0.00	16	5.18	16	5.42	0	0.00	16	5.06
19101	0	0.00	74	24.58	0	0.00	74	23.95	74	25.08	0	0.00	74	23.42
19120	0	0.00	194	64.45	0	0.00	194	62.78	194	65.76	0	0.00	194	61.39
19340	7	46.67	0	0.00	7	100.00	0	0.00	0	0.00	7	33.33	7	2.22
93503	0	0.00	3	1.00	0	0.00	3	0.97	3	1.02	0	0.00	3	0.95
ALL	15	100.00	301	100.00	7	100.00	309	100.00	295	100.00	21	100.00	316	100.00

APPENDIX B

HIP REPLACE

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
20680	73	24.25	0	.	73	48.99	0	0.00	0	0.00	73	26.07	73	24.25
20900	9	2.99	0	.	0	0.00	9	5.92	0	0.00	9	3.21	9	2.99
20902	71	23.59	0	.	0	0.00	71	46.71	0	0.00	71	25.36	71	23.59
25605	9	2.99	0	.	0	0.00	9	5.92	0	0.00	9	3.21	9	2.99
27000	8	2.66	0	.	0	0.00	8	5.26	0	0.00	8	2.86	8	2.66
27001	18	5.98	0	.	0	0.00	18	11.84	0	0.00	18	6.43	18	5.98
27033	11	3.65	0	.	11	7.38	0	0.00	11	52.38	0	0.00	11	3.65
27054	10	3.32	0	.	10	6.71	0	0.00	10	47.62	0	0.00	10	3.32
27090	22	7.31	0	.	22	14.77	0	0.00	0	0.00	22	7.86	22	7.31
27091	24	7.97	0	.	24	16.11	0	0.00	0	0.00	24	8.57	24	7.97
27140	9	2.99	0	.	9	6.04	0	0.00	0	0.00	9	3.21	9	2.99
27170	7	2.33	0	.	0	0.00	7	4.61	0	0.00	7	2.50	7	2.33
27236	10	3.32	0	.	0	0.00	10	6.58	0	0.00	10	3.57	10	3.32
27244	7	2.33	0	.	0	0.00	7	4.61	0	0.00	7	2.50	7	2.33
27506	13	4.32	0	.	0	0.00	13	8.55	0	0.00	13	4.64	13	4.32
ALL	301	100.00	0	.	149	100.00	152	100.00	21	100.00	280	100.00	301	100.00

APPENDIX B

FEMORAL FRAC

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
12001	6	3.43	0	.	0	.	6	3.43	0	.	6	3.43	6	3.43
20680	25	14.29	0	.	0	.	25	14.29	0	.	25	14.29	25	14.29
20900	7	4.00	0	.	0	.	7	4.00	0	.	7	4.00	7	4.00
20902	15	8.57	0	.	0	.	15	8.57	0	.	15	8.57	15	8.57
23600	20	11.43	0	.	0	.	20	11.43	0	.	20	11.43	20	11.43
24685	9	5.14	0	.	0	.	9	5.14	0	.	9	5.14	9	5.14
25600	11	6.29	0	.	0	.	11	6.29	0	.	11	6.29	11	6.29
25605	43	24.57	0	.	0	.	43	24.57	0	.	43	24.57	43	24.57
25610	16	9.14	0	.	0	.	16	9.14	0	.	16	9.14	16	9.14
25611	7	4.00	0	.	0	.	7	4.00	0	.	7	4.00	7	4.00
27125	4	2.29	0	.	0	.	4	2.29	0	.	4	2.29	4	2.29
27130	3	1.71	0	.	0	.	3	1.71	0	.	3	1.71	3	1.71
33210	9	5.14	0	.	0	.	9	5.14	0	.	9	5.14	9	5.14
ALL	175	100.00	0	.	0	.	175	100.00	0	.	175	100.00	175	100.00

APPENDIX B

KNEE A-PLASTY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
20610	0	0.00	14	73.68	0	0.00	14	24.14	0	0.00	14	6.51	14	5.02
20680	8	3.08	0	0.00	8	3.62	0	0.00	0	0.00	8	3.72	8	2.87
20900	10	3.85	0	0.00	10	4.52	0	0.00	0	0.00	10	4.65	10	3.58
20902	22	8.46	0	0.00	22	9.95	0	0.00	0	0.00	22	10.23	22	7.89
27334	11	4.23	0	0.00	11	4.98	0	0.00	11	17.19	0	0.00	11	3.94
27335	11	4.23	0	0.00	11	4.98	0	0.00	11	17.19	0	0.00	11	3.94
27405	5	1.92	0	0.00	5	2.26	0	0.00	0	0.00	5	2.33	5	1.79
27422	7	2.69	0	0.00	7	3.17	0	0.00	0	0.00	7	3.26	7	2.51
27425	125	48.08	0	0.00	125	56.56	0	0.00	0	0.00	125	58.14	125	44.80
27435	10	3.85	0	0.00	10	4.52	0	0.00	10	15.63	0	0.00	10	3.58
27437	5	1.92	0	0.00	5	2.26	0	0.00	5	7.81	0	0.00	5	1.79
27487	2	0.77	0	0.00	2	0.90	0	0.00	0	0.00	2	0.93	2	0.72
27488	5	1.92	0	0.00	5	2.26	0	0.00	0	0.00	5	2.33	5	1.79
29505	7	2.69	0	0.00	0	0.00	7	12.07	7	10.94	0	0.00	7	2.51
29870	0	0.00	5	26.32	0	0.00	5	8.62	0	0.00	5	2.33	5	1.79
36489	11	4.23	0	0.00	0	0.00	11	18.97	0	0.00	11	5.12	11	3.94
49505	1	0.38	0	0.00	0	0.00	1	1.72	0	0.00	1	0.47	1	0.36
62288	5	1.92	0	0.00	0	0.00	5	8.62	5	7.81	0	0.00	5	1.79
62289	15	5.77	0	0.00	0	0.00	15	25.86	15	23.44	0	0.00	15	5.38
ALL	260	100.00	19	100.00	221	100.00	58	100.00	64	100.00	215	100.00	279	100.00

APPENDIX 8

L-AMPUTATION

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
11000	3	5.45	0	0.00	0	0.00	3	5.77	0	0.00	3	5.56	3	4.92
11040	1	1.82	0	0.00	0	0.00	1	1.92	0	0.00	1	1.85	1	1.64
11041	3	5.45	0	0.00	0	0.00	3	5.77	0	0.00	3	5.56	3	4.92
11042	3	5.45	0	0.00	0	0.00	3	5.77	0	0.00	3	5.56	3	4.92
11043	9	16.36	0	0.00	0	0.00	9	17.31	0	0.00	9	16.67	9	14.75
11044	3	5.45	0	0.00	0	0.00	3	5.77	0	0.00	3	5.56	3	4.92
12031	6	10.91	0	0.00	6	66.67	0	0.00	6	85.71	0	0.00	6	9.84
20680	2	3.64	0	0.00	2	22.22	0	0.00	0	0.00	2	3.70	2	3.28
26951	8	14.55	0	0.00	0	0.00	8	15.38	0	0.00	8	14.81	8	13.11
27005	1	1.82	0	0.00	0	0.00	1	1.92	0	0.00	1	1.85	1	1.64
27598	1	1.82	0	0.00	1	11.11	0	0.00	1	14.29	0	0.00	1	1.64
28805	2	3.64	0	0.00	0	0.00	2	3.85	0	0.00	2	3.70	2	3.28
28810	1	1.82	0	0.00	0	0.00	1	1.92	0	0.00	1	1.85	1	1.64
28820	3	5.45	0	0.00	0	0.00	3	5.77	0	0.00	3	5.56	3	4.92
35741	0	0.00	2	33.33	0	0.00	2	3.85	0	0.00	2	3.70	2	3.28
35761	0	0.00	4	66.67	0	0.00	4	7.69	0	0.00	4	7.41	4	6.56
35875	3	5.45	0	0.00	0	0.00	3	5.77	0	0.00	3	5.56	3	4.92
35900	2	3.64	0	0.00	0	0.00	2	3.85	0	0.00	2	3.70	2	3.28
43832	4	7.27	0	0.00	0	0.00	4	7.69	0	0.00	4	7.41	4	6.56
ALL	55	100.00	6	100.00	9	100.00	52	100.00	7	100.00	54	100.00	61	100.00

APPENDIX B

KNEE A-SCOPY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
20610	0	0.00	6	13.95	0	0.00	6	13.95	6	1.74	0	0.00	6	1.57
27332	4	1.18	0	0.00	0	0.00	4	9.30	0	0.00	4	10.81	4	1.05
27345	11	3.24	0	0.00	0	0.00	11	25.58	0	0.00	11	29.73	11	2.88
27425	12	3.54	0	0.00	0	0.00	12	27.91	0	0.00	12	32.43	12	3.14
27570	10	2.95	0	0.00	0	0.00	10	23.26	0	0.00	10	27.03	10	2.62
29870	0	0.00	37	86.05	37	10.91	0	0.00	37	10.72	0	0.00	37	9.69
29874	17	5.01	0	0.00	17	5.01	0	0.00	17	4.93	0	0.00	17	4.45
29875	43	12.68	0	0.00	43	12.68	0	0.00	43	12.46	0	0.00	43	11.26
29876	32	9.44	0	0.00	32	9.44	0	0.00	32	9.28	0	0.00	32	8.38
29877	188	55.46	0	0.00	188	55.46	0	0.00	188	54.49	0	0.00	188	49.21
29879	20	5.90	0	0.00	20	5.90	0	0.00	20	5.80	0	0.00	20	5.24
29887	2	0.59	0	0.00	2	0.59	0	0.00	2	0.58	0	0.00	2	0.52
ALL	339	100.00	43	100.00	339	100.00	43	100.00	345	100.00	37	100.00	382	100.00

APPENDIX B

L-LOBECTOMY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
31622	0	0.00	155	57.20	0	0.00	155	63.01	0	0.00	155	63.01	155	50.32
31625	0	0.00	27	9.96	0	0.00	27	10.98	0	0.00	27	10.98	27	8.77
31645	4	10.81	0	0.00	0	0.00	4	1.63	0	0.00	4	1.63	4	1.30
32020	15	40.54	0	0.00	15	24.19	0	0.00	15	24.19	0	0.00	15	4.87
32095	0	0.00	1	0.37	1	1.61	0	0.00	1	1.61	0	0.00	1	0.32
32100	12	32.43	0	0.00	12	19.35	0	0.00	12	19.35	0	0.00	12	3.90
32110	1	2.70	0	0.00	1	1.61	0	0.00	1	1.61	0	0.00	1	0.32
32120	1	2.70	0	0.00	1	1.61	0	0.00	1	1.61	0	0.00	1	0.32
32140	2	5.41	0	0.00	2	3.23	0	0.00	2	3.23	0	0.00	2	0.65
32141	2	5.41	0	0.00	2	3.23	0	0.00	2	3.23	0	0.00	2	0.65
32500	0	0.00	28	10.33	28	45.16	0	0.00	28	45.16	0	0.00	28	9.09
39400	0	0.00	60	22.14	0	0.00	60	24.39	0	0.00	60	24.39	60	19.48
ALL	37	100.00	271	100.00	62	100.00	246	100.00	62	100.00	246	100.00	308	100.00

APPENDIX B

PACEMAKER

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
32000	3	1.23	0	0.00	0	0.00	3	1.56	0	0.00	3	1.21	3	0.96
32020	8	3.29	0	0.00	0	0.00	8	4.17	0	0.00	8	3.23	8	2.56
33200	17	7.00	0	0.00	17	14.17	0	0.00	17	26.56	0	0.00	17	5.45
33210	64	26.34	0	0.00	0	0.00	64	33.33	0	0.00	64	25.81	64	20.51
33212	43	17.70	0	0.00	43	35.83	0	0.00	43	67.19	0	0.00	43	13.78
33216	42	17.28	0	0.00	0	0.00	42	21.88	0	0.00	42	16.94	42	13.46
33218	4	1.65	0	0.00	0	0.00	4	2.08	0	0.00	4	1.61	4	1.28
33232	56	23.05	0	0.00	56	46.67	0	0.00	0	0.00	56	22.58	56	17.95
36000	4	1.65	0	0.00	4	3.33	0	0.00	4	6.25	0	0.00	4	1.28
36010	2	0.82	0	0.00	0	0.00	2	1.04	0	0.00	2	0.81	2	0.64
36489	0	0.00	18	26.09	0	0.00	18	9.38	0	0.00	18	7.26	18	5.77
36620	0	0.00	16	23.19	0	0.00	16	8.33	0	0.00	16	6.45	16	5.13
43235	0	0.00	4	5.80	0	0.00	4	2.08	0	0.00	4	1.61	4	1.28
93501	0	0.00	3	4.35	0	0.00	3	1.56	0	0.00	3	1.21	3	0.96
93503	0	0.00	8	11.59	0	0.00	8	4.17	0	0.00	8	3.23	8	2.56
93547	0	0.00	16	23.19	0	0.00	16	8.33	0	0.00	16	6.45	16	5.13
93549	0	0.00	4	5.80	0	0.00	4	2.08	0	0.00	4	1.61	4	1.28
ALL	243	100.00	69	100.00	120	100.00	192	100.00	64	100.00	248	100.00	312	100.00

APPENDIX B

A/M VALVE

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
33210	23	10.31	0	0.00	0	0.00	23	20.18	23	100.00	0	0.00	23	8.24
33425	7	3.14	0	0.00	7	4.24	0	0.00	0	0.00	7	2.73	7	2.51
33460	7	3.14	0	0.00	7	4.24	0	0.00	0	0.00	7	2.73	7	2.51
33510	89	39.91	0	0.00	89	53.94	0	0.00	0	0.00	89	34.77	89	31.90
33511	26	11.66	0	0.00	26	15.76	0	0.00	0	0.00	26	10.16	26	9.32
33512	11	4.93	0	0.00	11	6.67	0	0.00	0	0.00	11	4.30	11	3.94
33513	1	0.45	0	0.00	1	0.61	0	0.00	0	0.00	1	0.39	1	0.36
33514	1	0.45	0	0.00	1	0.61	0	0.00	0	0.00	1	0.39	1	0.36
33970	22	9.87	0	0.00	0	0.00	22	19.30	0	0.00	22	8.59	22	7.89
35820	16	7.17	0	0.00	16	9.70	0	0.00	0	0.00	16	6.25	16	5.73
36140	0	0.00	13	23.21	0	0.00	13	11.40	0	0.00	13	5.08	13	4.66
36491	0	0.00	11	19.64	0	0.00	11	9.65	0	0.00	11	4.30	11	3.94
36625	0	0.00	21	37.50	0	0.00	21	18.42	0	0.00	21	8.20	21	7.53
39020	7	3.14	0	0.00	7	4.24	0	0.00	0	0.00	7	2.73	7	2.51
93536	13	5.83	0	0.00	0	0.00	13	11.40	0	0.00	13	5.08	13	4.66
93549	0	0.00	11	19.64	0	0.00	11	9.65	0	0.00	11	4.30	11	3.94
ALL	223	100.00	56	100.00	165	100.00	114	100.00	23	100.00	256	100.00	279	100.00

APPENDIX B

CABG

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
33210	203	20.02	0	0.00	203	34.41	0	0.00	203	40.52	0	0.00	203	12.86
33405	189	18.64	0	0.00	189	32.03	0	0.00	0	0.00	189	17.53	189	11.97
33430	85	8.38	0	0.00	85	14.41	0	0.00	0	0.00	85	7.88	85	5.38
33542	47	4.64	0	0.00	47	7.97	0	0.00	0	0.00	47	4.36	47	2.98
33970	224	22.09	0	0.00	0	0.00	224	22.65	0	0.00	224	20.78	224	14.19
35301	50	4.93	0	0.00	0	0.00	50	5.06	0	0.00	50	4.64	50	3.17
35820	66	6.51	0	0.00	66	11.19	0	0.00	0	0.00	66	6.12	66	4.18
36140	0	0.00	100	17.70	0	0.00	100	10.11	0	0.00	100	9.28	100	6.33
36625	0	0.00	167	29.56	0	0.00	167	16.89	0	0.00	167	15.49	167	10.58
93536	150	14.79	0	0.00	0	0.00	150	15.17	0	0.00	150	13.91	150	9.50
93547	0	0.00	219	38.76	0	0.00	219	22.14	219	43.71	0	0.00	219	13.87
93549	0	0.00	79	13.98	0	0.00	79	7.99	79	15.77	0	0.00	79	5.00
ALL	1014	100.00	565	100.00	590	100.00	989	100.00	501	100.00	1078	100.00	1579	100.00

APPENDIX B

EMBOLECTOMY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
27590	3	5.26	0	0.00	0	0.00	3	7.69	0	0.00	3	5.88	3	5.00
27600	8	14.04	0	0.00	0	0.00	8	20.51	0	0.00	8	15.69	8	13.33
27602	12	21.05	0	0.00	0	0.00	12	30.77	0	0.00	12	23.53	12	20.00
34101	3	5.26	0	0.00	0	0.00	3	7.69	0	0.00	3	5.88	3	5.00
34203	8	14.04	0	0.00	0	0.00	8	20.51	0	0.00	8	15.69	8	13.33
35256	2	3.51	0	0.00	2	9.52	0	0.00	0	0.00	2	3.92	2	3.33
35286	2	3.51	0	0.00	2	9.52	0	0.00	0	0.00	2	3.92	2	3.33
35371	4	7.02	0	0.00	4	19.05	0	0.00	0	0.00	4	7.84	4	6.67
35381	2	3.51	0	0.00	0	0.00	2	5.13	0	0.00	2	3.92	2	3.33
35456	3	5.26	0	0.00	3	14.29	0	0.00	0	0.00	3	5.88	3	5.00
35721	6	10.53	0	0.00	6	28.57	0	0.00	6	66.67	0	0.00	6	10.00
35761	3	5.26	0	0.00	3	14.29	0	0.00	3	33.33	0	0.00	3	5.00
35860	1	1.75	0	0.00	1	4.76	0	0.00	0	0.00	1	1.96	1	1.67
36625	0	0.00	3	100.00	0	0.00	3	7.69	0	0.00	3	5.88	3	5.00
ALL	57	100.00	3	100.00	21	100.00	39	100.00	9	100.00	51	100.00	60	100.00

APPENDIX B

AB-ANEURYSM

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
34201	31	21.68	0	0.00	0	0.00	31	24.22	0	0.00	31	15.20	31	15.20
35131	15	10.49	0	0.00	15	19.74	0	0.00	0	0.00	15	7.35	15	7.35
35371	10	6.99	0	0.00	0	0.00	10	7.81	0	0.00	10	4.90	10	4.90
35641	13	9.09	0	0.00	13	17.11	0	0.00	0	0.00	13	6.37	13	6.37
35646	26	18.18	0	0.00	0	0.00	26	20.31	0	0.00	26	12.75	26	12.75
36491	0	0.00	25	40.98	0	0.00	25	19.53	0	0.00	25	12.25	25	12.25
36625	0	0.00	36	59.02	0	0.00	36	28.13	0	0.00	36	17.65	36	17.65
37620	8	5.59	0	0.00	8	10.53	0	0.00	0	0.00	8	3.92	8	3.92
43830	13	9.09	0	0.00	13	17.11	0	0.00	0	0.00	13	6.37	13	6.37
47600	27	18.88	0	0.00	27	35.53	0	0.00	0	0.00	27	13.24	27	13.24
ALL	143	100.00	61	100.00	76	100.00	128	100.00	0	0.00	204	100.00	204	100.00

APPENDIX B

ENDARTERECT

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
33570	3	11.11	0	0.00	0	0.00	3	4.62	0	0.00	3	3.37	3	2.50
34001	12	44.44	0	0.00	12	21.82	0	0.00	0	0.00	12	13.48	12	10.00
35800	12	44.44	0	0.00	12	21.82	0	0.00	0	0.00	12	13.48	12	10.00
36100	0	0.00	26	27.96	26	47.27	0	0.00	26	83.87	0	0.00	26	21.67
36101	0	0.00	5	5.38	5	9.09	0	0.00	5	16.13	0	0.00	5	4.17
36200	0	0.00	15	16.13	0	0.00	15	23.08	0	0.00	15	16.85	15	12.50
36215	0	0.00	12	12.90	0	0.00	12	18.46	0	0.00	12	13.48	12	10.00
36625	0	0.00	35	37.63	0	0.00	35	53.85	0	0.00	35	39.33	35	29.17
ALL	27	100.00	93	100.00	55	100.00	65	100.00	31	100.00	89	100.00	120	100.00

APPENDIX B

BYPASS GRFT

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
28820	16	5.23	0	0.00	0	0.00	16	9.14	0	0.00	16	3.84	16	3.73
34201	53	17.32	0	0.00	53	20.87	0	0.00	0	0.00	53	12.71	53	12.35
34203	14	4.58	0	0.00	14	5.51	0	0.00	0	0.00	14	3.36	14	3.26
35141	16	5.23	0	0.00	16	6.30	0	0.00	0	0.00	16	3.84	16	3.73
35286	10	3.27	0	0.00	10	3.94	0	0.00	10	83.33	0	0.00	10	2.33
35331	9	2.94	0	0.00	0	0.00	9	5.14	0	0.00	9	2.16	9	2.10
35371	57	18.63	0	0.00	0	0.00	57	32.57	0	0.00	57	13.67	57	13.29
35381	24	7.84	0	0.00	0	0.00	24	13.71	0	0.00	24	5.76	24	5.59
35454	13	4.25	0	0.00	13	5.12	0	0.00	0	0.00	13	3.12	13	3.03
35456	21	6.86	0	0.00	21	8.27	0	0.00	0	0.00	21	5.04	21	4.90
35571	2	0.65	0	0.00	2	0.79	0	0.00	2	16.67	0	0.00	2	0.47
35621	9	2.94	0	0.00	0	0.00	9	5.14	0	0.00	9	2.16	9	2.10
35661	24	7.84	0	0.00	0	0.00	24	13.71	0	0.00	24	5.76	24	5.59
35860	12	3.92	0	0.00	12	4.72	0	0.00	0	0.00	12	2.88	12	2.80
35875	13	4.25	0	0.00	13	5.12	0	0.00	0	0.00	13	3.12	13	3.03
36140	0	0.00	87	70.73	87	34.25	0	0.00	0	0.00	87	20.86	87	20.28
36200	0	0.00	13	10.57	13	5.12	0	0.00	0	0.00	13	3.12	13	3.03
36491	0	0.00	5	4.07	0	0.00	5	2.86	0	0.00	5	1.20	5	1.17
36625	0	0.00	18	14.63	0	0.00	18	10.29	0	0.00	18	4.32	18	4.20
64818	13	4.25	0	0.00	0	0.00	13	7.43	0	0.00	13	3.12	13	3.03
ALL	306	100.00	123	100.00	254	100.00	175	100.00	12	100.00	417	100.00	429	100.00

APPENDIX B

CHOLECYSTEC

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
36010	14	6.90	0	0.00	0	0.00	14	6.45	0	0.00	14	1.91	14	1.91
43235	0	0.00	48	9.06	0	0.00	48	22.12	0	0.00	48	6.55	48	6.55
43830	21	10.34	0	0.00	21	4.07	0	0.00	0	0.00	21	2.86	21	2.86
44005	40	19.70	0	0.00	40	7.75	0	0.00	0	0.00	40	5.46	40	5.46
44600	6	2.96	0	0.00	6	1.16	0	0.00	0	0.00	6	0.82	6	0.82
47000	0	0.00	64	12.08	64	12.40	0	0.00	0	0.00	64	8.73	64	8.73
47100	0	0.00	113	21.32	113	21.90	0	0.00	0	0.00	113	15.42	113	15.42
47420	15	7.39	0	0.00	15	2.91	0	0.00	0	0.00	15	2.05	15	2.05
47440	6	2.96	0	0.00	6	1.16	0	0.00	0	0.00	6	0.82	6	0.82
47550	0	0.00	178	33.58	178	34.50	0	0.00	0	0.00	178	24.28	178	24.28
47760	11	5.42	0	0.00	11	2.13	0	0.00	0	0.00	11	1.50	11	1.50
49000	0	0.00	33	6.23	33	6.40	0	0.00	0	0.00	33	4.50	33	4.50
49505	16	7.88	0	0.00	0	0.00	16	7.37	0	0.00	16	2.18	16	2.18
49560	29	14.29	0	0.00	29	5.62	0	0.00	0	0.00	29	3.96	29	3.96
49581	45	22.17	0	0.00	0	0.00	45	20.74	0	0.00	45	6.14	45	6.14
93503	0	0.00	94	17.74	0	0.00	94	43.32	0	0.00	94	12.82	94	12.82
ALL	203	100.00	530	100.00	516	100.00	217	100.00	0	0.00	733	100.00	733	100.00

APPENDIX B

LAPAROTOMY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
32020	3	2.56	0	0.00	0	0.00	3	3.06	0	0.00	3	1.83	3	1.34
36491	0	0.00	8	7.48	0	0.00	8	8.16	0	0.00	8	4.88	8	3.57
38500	0	0.00	2	1.87	2	1.59	0	0.00	2	3.33	0	0.00	2	0.89
43235	0	0.00	10	9.35	0	0.00	10	10.20	0	0.00	10	6.10	10	4.46
43830	5	4.27	0	0.00	5	3.97	0	0.00	0	0.00	5	3.05	5	2.23
44005	13	11.11	0	0.00	13	10.32	0	0.00	13	21.67	0	0.00	13	5.80
44015	5	4.27	0	0.00	5	3.97	0	0.00	0	0.00	5	3.05	5	2.23
44300	5	4.27	0	0.00	5	3.97	0	0.00	0	0.00	5	3.05	5	2.23
44305	9	7.69	0	0.00	9	7.14	0	0.00	0	0.00	9	5.49	9	4.02
44320	10	8.55	0	0.00	10	7.94	0	0.00	0	0.00	10	6.10	10	4.46
44950	8	6.84	0	0.00	8	6.35	0	0.00	8	13.33	0	0.00	8	3.57
44960	7	5.98	0	0.00	7	5.56	0	0.00	7	11.67	0	0.00	7	3.13
47000	0	0.00	5	4.67	5	3.97	0	0.00	0	0.00	5	3.05	5	2.23
47100	0	0.00	20	18.69	20	15.87	0	0.00	0	0.00	20	12.20	20	8.93
49020	6	5.13	0	0.00	6	4.76	0	0.00	6	10.00	0	0.00	6	2.68
49080	0	0.00	31	2.80	0	0.00	3	3.06	0	0.00	3	1.83	3	1.34
49180	0	0.00	71	6.54	0	0.00	7	7.14	0	0.00	7	4.27	7	3.13
49255	7	5.98	0	0.00	7	5.56	0	0.00	7	11.67	0	0.00	7	3.13
49421	7	5.98	0	0.00	7	5.56	0	0.00	0	0.00	7	4.27	7	3.13
49505	4	3.42	0	0.00	0	0.00	4	4.08	0	0.00	4	2.44	4	1.79
49550	7	5.98	0	0.00	0	0.00	7	7.14	0	0.00	7	4.27	7	3.13
52005	8	6.84	0	0.00	0	0.00	8	8.16	0	0.00	8	4.88	8	3.57
58720	9	7.69	0	0.00	9	7.14	0	0.00	9	15.00	0	0.00	9	4.02
58940	4	3.42	0	0.00	4	3.17	0	0.00	4	6.67	0	0.00	4	1.79
58980	0	0.00	4	3.74	4	3.17	0	0.00	4	6.67	0	0.00	4	1.79
93503	0	0.00	48	44.86	0	0.00	48	48.98	0	0.00	48	29.27	48	21.43
ALL	117	100.00	107	100.00	126	100.00	98	100.00	60	100.00	164	100.00	224	100.00

APPENDIX B

ING-HERNIA

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
11200	0	0.00	2	1.06	0	0.00	2	0.78	0	0.00	2	0.93	2	0.55
11400	0	0.00	6	3.19	0	0.00	6	2.35	0	0.00	6	2.80	6	1.65
11401	0	0.00	9	4.79	0	0.00	9	3.53	0	0.00	9	4.21	9	2.48
11402	0	0.00	15	7.98	0	0.00	15	5.88	0	0.00	15	7.01	15	4.13
11403	0	0.00	9	4.79	0	0.00	9	3.53	0	0.00	9	4.21	9	2.48
11404	0	0.00	8	4.26	0	0.00	8	3.14	0	0.00	8	3.74	8	2.20
11406	0	0.00	8	4.26	0	0.00	8	3.14	0	0.00	8	3.74	8	2.20
11420	0	0.00	10	5.32	0	0.00	10	3.92	0	0.00	10	4.67	10	2.75
11421	0	0.00	7	3.72	0	0.00	7	2.75	0	0.00	7	3.27	7	1.93
11422	0	0.00	7	3.72	0	0.00	7	2.75	0	0.00	7	3.27	7	1.93
11423	0	0.00	3	1.60	0	0.00	3	1.18	0	0.00	3	1.40	3	0.83
11424	0	0.00	3	1.60	0	0.00	3	1.18	0	0.00	3	1.40	3	0.83
11426	0	0.00	1	0.53	0	0.00	1	0.39	0	0.00	1	0.47	1	0.28
11440	0	0.00	3	1.60	0	0.00	3	1.18	0	0.00	3	1.40	3	0.83
11441	0	0.00	6	3.19	0	0.00	6	2.35	0	0.00	6	2.80	6	1.65
11442	0	0.00	8	4.26	0	0.00	8	3.14	0	0.00	8	3.74	8	2.20
11443	0	0.00	1	0.53	0	0.00	1	0.39	0	0.00	1	0.47	1	0.28
11444	0	0.00	2	1.06	0	0.00	2	0.78	0	0.00	2	0.93	2	0.55
11450	0	0.00	1	0.53	0	0.00	1	0.39	0	0.00	1	0.47	1	0.28
11462	0	0.00	1	0.53	0	0.00	1	0.39	0	0.00	1	0.47	1	0.28
38500	0	0.00	3	1.60	0	0.00	3	1.18	0	0.00	3	1.40	3	0.83
44950	6	3.43	0	0.00	0	0.00	6	2.35	0	0.00	6	2.80	6	1.65
45300	0	0.00	15	7.98	0	0.00	15	5.88	0	0.00	15	7.01	15	4.13
45330	0	0.00	20	10.64	0	0.00	20	7.84	0	0.00	20	9.35	20	5.51
45378	0	0.00	9	4.79	0	0.00	9	3.53	0	0.00	9	4.21	9	2.48
49255	8	4.57	0	0.00	8	7.41	0	0.00	8	5.37	0	0.00	8	2.20
49550	11	6.29	0	0.00	11	10.19	0	0.00	11	7.38	0	0.00	11	3.03
49560	10	5.71	0	0.00	0	0.00	10	3.92	10	6.71	0	0.00	10	2.75
49581	31	17.71	0	0.00	0	0.00	31	12.16	31	20.81	0	0.00	31	8.54
52000	0	0.00	19	10.11	0	0.00	19	7.45	0	0.00	19	8.88	19	5.23
52281	9	5.14	0	0.00	0	0.00	9	3.53	0	0.00	9	4.21	9	2.48
54161	11	6.29	0	0.00	0	0.00	11	4.31	0	0.00	11	5.14	11	3.03
54520	31	17.71	0	0.00	31	28.70	0	0.00	31	20.81	0	0.00	31	8.54
54521	3	1.71	0	0.00	3	2.78	0	0.00	3	2.01	0	0.00	3	0.83
55040	21	12.00	0	0.00	21	19.44	0	0.00	21	14.09	0	0.00	21	5.79
55520	34	19.43	0	0.00	34	31.48	0	0.00	34	22.82	0	0.00	34	9.37
55700	0	0.00	12	6.38	0	0.00	12	4.71	0	0.00	12	5.61	12	3.31
ALL	175	100.00	188	100.00	108	100.00	255	100.00	149	100.00	214	100.00	363	100.00

APPENDIX B

VENT-HERNIA

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
10121	1	1.64	0	0.00	1	1.64	0	0.00	1	10.00	0	0.00	1	0.92
11401	0	0.00	2	4.17	0	0.00	2	4.17	0	0.00	2	2.02	2	1.83
11402	0	0.00	10	20.83	0	0.00	10	20.83	0	0.00	10	10.10	10	9.17
11403	0	0.00	4	8.33	0	0.00	4	8.33	0	0.00	4	4.04	4	3.67
11404	0	0.00	2	4.17	0	0.00	2	4.17	0	0.00	2	2.02	2	1.83
11406	0	0.00	1	2.08	0	0.00	1	2.08	0	0.00	1	1.01	1	0.92
11421	0	0.00	1	2.08	0	0.00	1	2.08	0	0.00	1	1.01	1	0.92
11423	0	0.00	1	2.08	0	0.00	1	2.08	0	0.00	1	1.01	1	0.92
11424	0	0.00	1	2.08	0	0.00	1	2.08	0	0.00	1	1.01	1	0.92
11426	0	0.00	1	2.08	0	0.00	1	2.08	0	0.00	1	1.01	1	0.92
11440	0	0.00	1	2.08	0	0.00	1	2.08	0	0.00	1	1.01	1	0.92
11441	0	0.00	2	4.17	0	0.00	2	4.17	0	0.00	2	2.02	2	1.83
36491	0	0.00	6	12.50	0	0.00	6	12.50	0	0.00	6	6.06	6	5.50
43235	0	0.00	3	6.25	0	0.00	3	6.25	0	0.00	3	3.03	3	2.75
43830	3	4.92	0	0.00	3	4.92	0	0.00	0	0.00	3	3.03	3	2.75
44021	3	4.92	0	0.00	3	4.92	0	0.00	0	0.00	3	3.03	3	2.75
44345	6	9.84	0	0.00	6	9.84	0	0.00	0	0.00	6	6.06	6	5.50
44600	3	4.92	0	0.00	3	4.92	0	0.00	0	0.00	3	3.03	3	2.75
44620	5	8.20	0	0.00	5	8.20	0	0.00	0	0.00	5	5.05	5	4.59
45330	0	0.00	6	12.50	0	0.00	6	12.50	0	0.00	6	6.06	6	5.50
45378	0	0.00	4	8.33	0	0.00	4	8.33	0	0.00	4	4.04	4	3.67
47100	0	0.00	3	6.25	3	4.92	0	0.00	0	0.00	3	3.03	3	2.75
49255	9	14.75	0	0.00	9	14.75	0	0.00	9	90.00	0	0.00	9	8.26
49550	3	4.92	0	0.00	0	0.00	3	6.25	0	0.00	3	3.03	3	2.75
49581	25	40.98	0	0.00	25	40.98	0	0.00	0	0.00	25	25.25	25	22.94
49900	3	4.92	0	0.00	3	4.92	0	0.00	0	0.00	3	3.03	3	2.75
ALL	61	100.00	48	100.00	61	100.00	48	100.00	10	100.00	99	100.00	109	100.00

APPENDIX B

RENAL TRANS

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
35221	1	1.85	0	0.00	0	0.00	1	3.57	0	0.00	1	3.57	1	1.54
35351	5	9.26	0	0.00	5	13.51	0	0.00	5	13.51	0	0.00	5	7.69
36491	0	0.00	5	45.45	0	0.00	5	17.86	0	0.00	5	17.86	5	7.69
36625	0	0.00	3	27.27	0	0.00	3	10.71	0	0.00	3	10.71	3	4.62
49421	4	7.41	0	0.00	0	0.00	4	14.29	0	0.00	4	14.29	4	6.15
50205	0	0.00	3	27.27	3	8.11	0	0.00	3	8.11	0	0.00	3	4.62
50320	15	27.78	0	0.00	0	0.00	15	53.57	0	0.00	15	53.57	15	23.08
50340	1	1.85	0	0.00	1	2.70	0	0.00	1	2.70	0	0.00	1	1.54
50780	24	44.44	0	0.00	24	64.86	0	0.00	24	64.86	0	0.00	24	36.92
50785	4	7.41	0	0.00	4	10.81	0	0.00	4	10.81	0	0.00	4	6.15
ALL	54	100.00	11	100.00	37	100.00	28	100.00	37	100.00	28	100.00	65	100.00

APPENDIX B

TURP

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
49505	130	10.20	0	0.00	0	0.00	130	16.82	0	0.00	130	11.24	130	7.85
51010	28	2.20	0	0.00	0	0.00	28	3.62	0	0.00	28	2.42	28	1.69
51040	21	1.65	0	0.00	0	0.00	21	2.72	0	0.00	21	1.82	21	1.27
51050	14	1.10	0	0.00	0	0.00	14	1.81	0	0.00	14	1.21	14	0.85
51725	0	0.00	23	6.04	0	0.00	23	2.98	0	0.00	23	1.99	23	1.39
51726	0	0.00	42	11.02	0	0.00	42	5.43	0	0.00	42	3.63	42	2.54
52000	0	0.00	106	27.82	106	12.00	0	0.00	106	21.24	0	0.00	106	6.40
52005	120	9.41	0	0.00	120	13.59	0	0.00	120	24.05	0	0.00	120	7.25
52204	0	0.00	44	11.55	44	4.98	0	0.00	0	0.00	44	3.80	44	2.66
52234	0	0.00	56	14.70	56	6.34	0	0.00	0	0.00	56	4.84	56	3.38
52235	0	0.00	53	13.91	53	6.00	0	0.00	0	0.00	53	4.58	53	3.20
52240	0	0.00	57	14.96	57	6.46	0	0.00	0	0.00	57	4.93	57	3.44
52275	40	3.14	0	0.00	40	4.53	0	0.00	40	8.02	0	0.00	40	2.42
52276	59	4.63	0	0.00	59	6.68	0	0.00	59	11.82	0	0.00	59	3.56
52281	57	4.47	0	0.00	57	6.46	0	0.00	57	11.42	0	0.00	57	3.44
52310	29	2.27	0	0.00	29	3.28	0	0.00	0	0.00	29	2.51	29	1.75
52317	79	6.20	0	0.00	79	8.95	0	0.00	0	0.00	79	6.83	79	4.77
52318	66	5.18	0	0.00	66	7.47	0	0.00	0	0.00	66	5.70	66	3.99
52340	33	2.59	0	0.00	33	3.74	0	0.00	33	6.61	0	0.00	33	1.99
52500	36	2.82	0	0.00	36	4.08	0	0.00	36	7.21	0	0.00	36	2.17
53600	18	1.41	0	0.00	18	2.04	0	0.00	18	3.61	0	0.00	18	1.09
53670	30	2.35	0	0.00	30	3.40	0	0.00	30	6.01	0	0.00	30	1.81
54161	74	5.80	0	0.00	0	0.00	74	9.57	0	0.00	74	6.40	74	4.47
54520	124	9.73	0	0.00	0	0.00	124	16.04	0	0.00	124	10.72	124	7.49
54521	91	7.14	0	0.00	0	0.00	91	11.77	0	0.00	91	7.87	91	5.50
55040	32	2.51	0	0.00	0	0.00	32	4.14	0	0.00	32	2.77	32	1.93
55700	194	15.22	0	0.00	0	0.00	194	25.10	0	0.00	194	16.77	194	11.71
ALL	1275	100.00	381	100.00	883	100.00	773	100.00	499	100.00	1157	100.00	1656	100.00

APPENDIX B

T-HYSTERECT

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
38500	0	0.00	10	7.41	10	4.15	0	0.00	0	0.00	10	2.82	10	2.38
38562	0	0.00	13	9.63	13	5.39	0	0.00	0	0.00	13	3.66	13	3.10
38780	0	0.00	4	2.96	4	1.66	0	0.00	0	0.00	4	1.13	4	0.95
44140	4	1.40	0	0.00	0	0.00	4	2.23	0	0.00	4	1.13	4	0.95
44950	7	2.46	0	0.00	7	2.90	0	0.00	0	0.00	7	1.97	7	1.67
44955	9	3.16	0	0.00	9	3.73	0	0.00	0	0.00	9	2.54	9	2.14
47600	3	1.05	0	0.00	0	0.00	3	1.68	0	0.00	3	0.85	3	0.71
49000	0	0.00	21	15.56	21	8.71	0	0.00	21	32.31	0	0.00	21	5.00
49201	3	1.05	0	0.00	3	1.24	0	0.00	0	0.00	3	0.85	3	0.71
49255	48	16.84	0	0.00	48	19.92	0	0.00	0	0.00	48	13.52	48	11.43
49560	7	2.46	0	0.00	7	2.90	0	0.00	0	0.00	7	1.97	7	1.67
49581	8	2.81	0	0.00	0	0.00	8	4.47	0	0.00	8	2.25	8	1.90
51840	32	11.23	0	0.00	32	13.28	0	0.00	0	0.00	32	9.01	32	7.62
52000	0	0.00	6	4.44	0	0.00	6	3.35	0	0.00	6	1.69	6	1.43
52005	22	7.72	0	0.00	0	0.00	22	12.29	0	0.00	22	6.20	22	5.24
52332	8	2.81	0	0.00	0	0.00	8	4.47	0	0.00	8	2.25	8	1.90
57240	22	7.72	0	0.00	0	0.00	22	12.29	0	0.00	22	6.20	22	5.24
57250	13	4.56	0	0.00	0	0.00	13	7.26	0	0.00	13	3.66	13	3.10
57260	12	4.21	0	0.00	0	0.00	12	6.70	0	0.00	12	3.38	12	2.86
57270	7	2.46	0	0.00	7	2.90	0	0.00	0	0.00	7	1.97	7	1.67
57280	10	3.51	0	0.00	10	4.15	0	0.00	0	0.00	10	2.82	10	2.38
57410	0	0.00	11	8.15	0	0.00	11	6.15	11	16.92	0	0.00	11	2.62
57520	0	0.00	6	4.44	0	0.00	6	3.35	0	0.00	6	1.69	6	1.43
58120	0	0.00	46	34.07	0	0.00	46	25.70	0	0.00	46	12.96	46	10.95
58720	33	11.58	0	0.00	33	13.69	0	0.00	33	50.77	0	0.00	33	7.86
58740	37	12.98	0	0.00	37	15.35	0	0.00	0	0.00	37	10.42	37	8.81
58980	0	0.00	10	7.41	0	0.00	10	5.59	0	0.00	10	2.82	10	2.38
58985	0	0.00	8	5.93	0	0.00	8	4.47	0	0.00	8	2.25	8	1.90
ALL	285	100.00	135	100.00	241	100.00	179	100.00	65	100.00	355	100.00	420	100.00

APPENDIX B

V-HYSTERECT

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
45560	2	0.87	0	0.00	0	0.00	2	0.79	0	0.00	2	0.78	2	0.73
46260	2	0.87	0	0.00	0	0.00	2	0.79	0	0.00	2	0.78	2	0.73
49505	5	2.16	0	0.00	0	0.00	5	1.98	0	0.00	5	1.95	5	1.82
49581	1	0.43	0	0.00	0	0.00	1	0.40	0	0.00	1	0.39	1	0.36
51010	41	17.75	0	0.00	0	0.00	41	16.21	0	0.00	41	15.95	41	14.96
51040	19	8.23	0	0.00	0	0.00	19	7.51	0	0.00	19	7.39	19	6.93
51840	9	3.90	0	0.00	0	0.00	9	3.56	9	52.94	0	0.00	9	3.28
51841	2	0.87	0	0.00	0	0.00	2	0.79	2	11.76	0	0.00	2	0.73
51845	15	6.49	0	0.00	0	0.00	15	5.93	0	0.00	15	5.84	15	5.47
52000	0	0.00	8	18.60	0	0.00	8	3.16	0	0.00	8	3.11	8	2.92
57120	6	2.60	0	0.00	0	0.00	6	2.37	0	0.00	6	2.33	6	2.19
57220	5	2.16	0	0.00	0	0.00	5	1.98	0	0.00	5	1.95	5	1.82
57240	22	9.52	0	0.00	0	0.00	22	8.70	0	0.00	22	8.56	22	8.03
57250	18	7.79	0	0.00	0	0.00	18	7.11	0	0.00	18	7.00	18	6.57
57260	31	13.42	0	0.00	0	0.00	31	12.25	0	0.00	31	12.06	31	11.31
57265	10	4.33	0	0.00	0	0.00	10	3.95	0	0.00	10	3.89	10	3.65
57268	14	6.06	0	0.00	0	0.00	14	5.53	0	0.00	14	5.45	14	5.11
57270	4	1.73	0	0.00	0	0.00	4	1.58	0	0.00	4	1.56	4	1.46
57282	16	6.93	0	0.00	0	0.00	16	6.32	0	0.00	16	6.23	16	5.84
57288	3	1.30	0	0.00	0	0.00	3	1.19	0	0.00	3	1.17	3	1.09
57289	3	1.30	0	0.00	0	0.00	3	1.19	0	0.00	3	1.17	3	1.09
57410	0	0.00	5	11.63	0	0.00	5	1.98	5	29.41	0	0.00	5	1.82
58120	0	0.00	10	23.26	0	0.00	10	3.95	0	0.00	10	3.89	10	3.65
58150	1	0.43	0	0.00	1	4.76	0	0.00	1	5.88	0	0.00	1	0.36
58270	2	0.87	0	0.00	0	0.00	2	0.79	0	0.00	2	0.78	2	0.73
58720	0	0.00	16	37.21	16	76.19	0	0.00	0	0.00	16	6.23	16	5.84
58940	0	0.00	4	9.30	4	19.05	0	0.00	0	0.00	4	1.56	4	1.46
ALL	231	100.00	43	100.00	21	100.00	253	100.00	17	100.00	257	100.00	274	100.00

APPENDIX B

LAMINECTOMY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
15770	3	2.48	0	0.00	3	2.80	0	0.00	3	4.84	0	0.00	3	2.38
20902	1	0.83	0	0.00	1	0.93	0	0.00	0	0.00	1	1.56	1	0.79
22102	3	2.48	0	0.00	3	2.80	0	0.00	3	4.84	0	0.00	3	2.38
22612	9	7.44	0	0.00	9	8.41	0	0.00	0	0.00	9	14.06	9	7.14
22625	13	10.74	0	0.00	13	12.15	0	0.00	0	0.00	13	20.31	13	10.32
22630	6	4.96	0	0.00	6	5.61	0	0.00	0	0.00	6	9.38	6	4.76
22650	9	7.44	0	0.00	9	8.41	0	0.00	0	0.00	9	14.06	9	7.14
22800	1	0.83	0	0.00	1	0.93	0	0.00	0	0.00	1	1.56	1	0.79
22820	10	8.26	0	0.00	0	0.00	10	52.63	0	0.00	10	15.63	10	7.94
22840	2	1.65	0	0.00	2	1.87	0	0.00	0	0.00	2	3.13	2	1.59
22842	4	3.31	0	0.00	4	3.74	0	0.00	0	0.00	4	6.25	4	3.17
61712	13	10.74	0	0.00	13	12.15	0	0.00	13	20.97	0	0.00	13	10.32
62284	0	0.00	5	100.00	0	0.00	5	26.32	0	0.00	5	7.81	5	3.97
63020	2	1.65	0	0.00	2	1.87	0	0.00	2	3.23	0	0.00	2	1.59
63030	19	15.70	0	0.00	19	17.76	0	0.00	19	30.65	0	0.00	19	15.08
63031	2	1.65	0	0.00	2	1.87	0	0.00	2	3.23	0	0.00	2	1.59
63035	15	12.40	0	0.00	15	14.02	0	0.00	15	24.19	0	0.00	15	11.90
63042	2	1.65	0	0.00	0	0.00	2	10.53	0	0.00	2	3.13	2	1.59
63600	2	1.65	0	0.00	0	0.00	2	10.53	0	0.00	2	3.13	2	1.59
63709	2	1.65	0	0.00	2	1.87	0	0.00	2	3.23	0	0.00	2	1.59
63710	3	2.48	0	0.00	3	2.80	0	0.00	3	4.84	0	0.00	3	2.38
ALL	121	100.00	5	100.00	107	100.00	19	100.00	62	100.00	64	100.00	126	100.00

APPENDIX B

LAMINOTOMY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
22107	2	1.63	0	0.00	2	1.89	0	0.00	2	6.90	0	0.00	2	1.52
22612	16	13.01	0	0.00	16	15.09	0	0.00	0	0.00	16	15.53	16	12.12
22625	15	12.20	0	0.00	15	14.15	0	0.00	0	0.00	15	14.56	15	11.36
22650	13	10.57	0	0.00	13	12.26	0	0.00	0	0.00	13	12.62	13	9.85
22820	11	8.94	0	0.00	0	0.00	11	42.31	0	0.00	11	10.68	11	8.33
61712	27	21.95	0	0.00	27	25.47	0	0.00	27	93.10	0	0.00	27	20.45
62284	0	0.00	9	100.00	0	0.00	9	34.62	0	0.00	9	8.74	9	6.82
63005	10	8.13	0	0.00	10	9.43	0	0.00	0	0.00	10	9.71	10	7.58
63017	1	0.81	0	0.00	1	0.94	0	0.00	0	0.00	1	0.97	1	0.76
63047	6	4.88	0	0.00	6	5.66	0	0.00	0	0.00	6	5.83	6	4.55
63048	16	13.01	0	0.00	16	15.09	0	0.00	0	0.00	16	15.53	16	12.12
64714	6	4.88	0	0.00	0	0.00	6	23.08	0	0.00	6	5.83	6	4.55
ALL	123	100.00	9	100.00	106	100.00	26	100.00	29	100.00	103	100.00	132	100.00

APPENDIX B

CARPAL REP

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
11401	3	0.74	0	.	0	0.00	3	1.30	0	0.00	3	0.90	3	0.74
11402	4	0.99	0	.	0	0.00	4	1.73	0	0.00	4	1.20	4	0.99
11403	2	0.49	0	.	0	0.00	2	0.87	0	0.00	2	0.60	2	0.49
11404	1	0.25	0	.	0	0.00	1	0.43	0	0.00	1	0.30	1	0.25
11406	1	0.25	0	.	0	0.00	1	0.43	0	0.00	1	0.30	1	0.25
11420	1	0.25	0	.	0	0.00	1	0.43	0	0.00	1	0.30	1	0.25
11422	2	0.49	0	.	0	0.00	2	0.87	0	0.00	2	0.60	2	0.49
11424	1	0.25	0	.	0	0.00	1	0.43	0	0.00	1	0.30	1	0.25
11426	1	0.25	0	.	0	0.00	1	0.43	0	0.00	1	0.30	1	0.25
11442	2	0.49	0	.	0	0.00	2	0.87	0	0.00	2	0.60	2	0.49
20605	11	2.71	0	.	0	0.00	11	4.76	0	0.00	11	3.30	11	2.71
20610	8	1.97	0	.	0	0.00	8	3.46	0	0.00	8	2.40	8	1.97
25000	6	1.48	0	.	0	0.00	6	2.60	0	0.00	6	1.80	6	1.48
25020	6	1.48	0	.	6	3.43	0	0.00	6	8.22	0	0.00	6	1.48
25105	3	0.74	0	.	0	0.00	3	1.30	0	0.00	3	0.90	3	0.74
25111	15	3.69	0	.	0	0.00	15	6.49	0	0.00	15	4.50	15	3.69
25115	37	9.11	0	.	37	21.14	0	0.00	37	50.68	0	0.00	37	9.11
25118	7	1.72	0	.	0	0.00	7	3.03	0	0.00	7	2.10	7	1.72
25295	6	1.48	0	.	0	0.00	6	2.60	0	0.00	6	1.80	6	1.48
26055	66	16.26	0	.	0	0.00	66	28.57	0	0.00	66	19.82	66	16.26
26116	6	1.48	0	.	0	0.00	6	2.60	0	0.00	6	1.80	6	1.48
26120	3	0.74	0	.	0	0.00	3	1.30	0	0.00	3	0.90	3	0.74
26145	27	6.65	0	.	0	0.00	27	11.69	0	0.00	27	8.11	27	6.65
26160	9	2.22	0	.	0	0.00	9	3.90	0	0.00	9	2.70	9	2.22
26170	4	0.99	0	.	0	0.00	4	1.73	0	0.00	4	1.20	4	0.99
26440	1	0.25	0	.	0	0.00	1	0.43	0	0.00	1	0.30	1	0.25
29075	10	2.46	0	.	0	0.00	10	4.33	0	0.00	10	3.00	10	2.46
29125	23	5.67	0	.	0	0.00	23	9.96	23	31.51	0	0.00	23	5.67
64450	8	1.97	0	.	0	0.00	8	3.46	0	0.00	8	2.40	8	1.97
64719	44	10.84	0	.	44	25.14	0	0.00	0	0.00	44	13.21	44	10.84
64722	7	1.72	0	.	7	4.00	0	0.00	7	9.59	0	0.00	7	1.72
64727	78	19.21	0	.	78	44.57	0	0.00	0	0.00	78	23.42	78	19.21
64830	3	0.74	0	.	3	1.71	0	0.00	0	0.00	3	0.90	3	0.74
ALL	406	100.00	0	.	175	100.00	231	100.00	73	100.00	333	100.00	406	100.00

APPENDIX B

CATARACT EX

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
64405	565	18.01	0	.	0	0.00	565	28.45	565	27.89	0	0.00	565	18.01
65420	148	4.72	0	.	0	0.00	148	7.45	0	0.00	148	13.31	148	4.72
65850	43	1.37	0	.	43	3.73	0	0.00	0	0.00	43	3.87	43	1.37
65875	39	1.24	0	.	39	3.39	0	0.00	39	1.92	0	0.00	39	1.24
66020	31	0.99	0	.	31	2.69	0	0.00	31	1.53	0	0.00	31	0.99
66160	49	1.56	0	.	49	4.25	0	0.00	0	0.00	49	4.41	49	1.56
66170	672	21.41	0	.	672	58.33	0	0.00	0	0.00	672	60.43	672	21.41
66625	171	5.45	0	.	171	14.84	0	0.00	171	8.44	0	0.00	171	5.45
66680	48	1.53	0	.	0	0.00	48	2.42	0	0.00	48	4.32	48	1.53
66740	31	0.99	0	.	0	0.00	31	1.56	0	0.00	31	2.79	31	0.99
66820	5	0.16	0	.	5	0.43	0	0.00	5	0.25	0	0.00	5	0.16
66821	50	1.59	0	.	0	0.00	50	2.52	0	0.00	50	4.50	50	1.59
66985	2	0.06	0	.	2	0.17	0	0.00	2	0.10	0	0.00	2	0.06
67005	56	1.78	0	.	56	4.86	0	0.00	56	2.76	0	0.00	56	1.78
67010	84	2.68	0	.	84	7.29	0	0.00	84	4.15	0	0.00	84	2.68
67500	615	19.60	0	.	0	0.00	615	30.97	615	30.36	0	0.00	615	19.60
67515	158	5.04	0	.	0	0.00	158	7.96	158	7.80	0	0.00	158	5.04
67715	64	2.04	0	.	0	0.00	64	3.22	0	0.00	64	5.76	64	2.04
68200	300	9.56	0	.	0	0.00	300	15.11	300	14.81	0	0.00	300	9.56
68320	7	0.22	0	.	0	0.00	7	0.35	0	0.00	7	0.63	7	0.22
ALL	3138	100.00	0	.	1152	100.00	1986	100.00	2026	100.00	1112	100.00	3138	100.00

APPENDIX B

LENS INSERT

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
64405	19	8.96	0	.	0	0.00	19	15.97	19	14.62	0	0.00	19	8.96
65750	3	1.42	0	.	0	0.00	3	2.52	0	0.00	3	3.66	3	1.42
65810	6	2.83	0	.	6	6.45	0	0.00	6	4.62	0	0.00	6	2.83
65865	5	2.36	0	.	5	5.38	0	0.00	0	0.00	5	6.10	5	2.36
65870	8	3.77	0	.	8	8.60	0	0.00	8	6.15	0	0.00	8	3.77
65875	3	1.42	0	.	3	3.23	0	0.00	3	2.31	0	0.00	3	1.42
65920	45	21.23	0	.	0	0.00	45	37.82	0	0.00	45	54.88	45	21.23
66170	7	3.30	0	.	0	0.00	7	5.88	0	0.00	7	8.54	7	3.30
66250	3	1.42	0	.	0	0.00	3	2.52	0	0.00	3	3.66	3	1.42
66625	3	1.42	0	.	3	3.23	0	0.00	3	2.31	0	0.00	3	1.42
66680	7	3.30	0	.	0	0.00	7	5.88	0	0.00	7	8.54	7	3.30
67005	29	13.68	0	.	29	31.18	0	0.00	29	22.31	0	0.00	29	13.68
67010	39	18.40	0	.	39	41.94	0	0.00	39	30.00	0	0.00	39	18.40
67036	7	3.30	0	.	0	0.00	7	5.88	0	0.00	7	8.54	7	3.30
67121	5	2.36	0	.	0	0.00	5	4.20	0	0.00	5	6.10	5	2.36
67500	10	4.72	0	.	0	0.00	10	8.40	10	7.69	0	0.00	10	4.72
68200	13	6.13	0	.	0	0.00	13	10.92	13	10.00	0	0.00	13	6.13
ALL	212	100.00	0	.	93	100.00	119	100.00	130	100.00	82	100.00	212	100.00

APPENDIX B

PTCA

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
33210	276	74.19	0	0.00	0	0.00	276	59.48	0	0.00	276	21.36	276	18.03
33970	11	2.96	0	0.00	11	1.03	0	0.00	0	0.00	11	0.85	11	0.72
36230	0	0.00	24	2.07	24	2.25	0	0.00	24	10.04	0	0.00	24	1.57
36489	0	0.00	26	2.24	0	0.00	26	5.60	0	0.00	26	2.01	26	1.70
36620	0	0.00	42	3.62	42	3.94	0	0.00	42	17.57	0	0.00	42	2.74
92975	26	6.99	0	0.00	26	2.44	0	0.00	0	0.00	26	2.01	26	1.70
93501	0	0.00	67	5.78	0	0.00	67	14.44	0	0.00	67	5.19	67	4.38
93503	0	0.00	68	5.87	0	0.00	68	14.66	0	0.00	68	5.26	68	4.44
93510	0	0.00	69	5.95	69	6.47	0	0.00	69	28.87	0	0.00	69	4.51
93526	0	0.00	27	2.33	0	0.00	27	5.82	0	0.00	27	2.09	27	1.76
93536	59	15.86	0	0.00	59	5.53	0	0.00	0	0.00	59	4.57	59	3.85
93545	0	0.00	104	8.97	104	9.75	0	0.00	104	43.51	0	0.00	104	6.79
93547	0	0.00	492	42.45	492	46.11	0	0.00	0	0.00	492	38.08	492	32.14
93548	0	0.00	18	1.55	18	1.69	0	0.00	0	0.00	18	1.39	18	1.18
93549	0	0.00	188	16.22	188	17.62	0	0.00	0	0.00	188	14.55	188	12.28
93552	0	0.00	34	2.93	34	3.19	0	0.00	0	0.00	34	2.63	34	2.22
ALL	372	100.00	1159	100.00	1067	100.00	464	100.00	239	100.00	1292	100.00	1531	100.00

APPENDIX B

S-PROSTATEC

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
49505	3	6.00	0	0.00	3	9.68	0	0.00	0	0.00	3	10.71	3	4.11
49560	2	4.00	0	0.00	2	6.45	0	0.00	0	0.00	2	7.14	2	2.74
50392	1	2.00	0	0.00	0	0.00	1	2.38	0	0.00	1	3.57	1	1.37
51010	1	2.00	0	0.00	1	3.23	0	0.00	1	2.22	0	0.00	1	1.37
51040	3	6.00	0	0.00	3	9.68	0	0.00	3	6.67	0	0.00	3	4.11
51050	11	22.00	0	0.00	11	35.48	0	0.00	11	24.44	0	0.00	11	15.07
51060	1	2.00	0	0.00	1	3.23	0	0.00	0	0.00	1	3.57	1	1.37
51525	7	14.00	0	0.00	7	22.58	0	0.00	0	0.00	7	25.00	7	9.59
51530	1	2.00	0	0.00	1	3.23	0	0.00	0	0.00	1	3.57	1	1.37
51550	1	2.00	0	0.00	1	3.23	0	0.00	0	0.00	1	3.57	1	1.37
51800	1	2.00	0	0.00	1	3.23	0	0.00	0	0.00	1	3.57	1	1.37
52000	0	0.00	20	86.96	0	0.00	20	47.62	20	44.44	0	0.00	20	27.40
52005	0	0.00	3	13.04	0	0.00	3	7.14	3	6.67	0	0.00	3	4.11
52234	1	2.00	0	0.00	0	0.00	1	2.38	0	0.00	1	3.57	1	1.37
52275	1	2.00	0	0.00	0	0.00	1	2.38	0	0.00	1	3.57	1	1.37
52276	1	2.00	0	0.00	0	0.00	1	2.38	0	0.00	1	3.57	1	1.37
52281	4	8.00	0	0.00	0	0.00	4	9.52	4	8.89	0	0.00	4	5.48
52315	1	2.00	0	0.00	0	0.00	1	2.38	0	0.00	1	3.57	1	1.37
52340	1	2.00	0	0.00	0	0.00	1	2.38	1	2.22	0	0.00	1	1.37
53020	1	2.00	0	0.00	0	0.00	1	2.38	1	2.22	0	0.00	1	1.37
53240	1	2.00	0	0.00	0	0.00	1	2.38	0	0.00	1	3.57	1	1.37
53605	1	2.00	0	0.00	0	0.00	1	2.38	1	2.22	0	0.00	1	1.37
54161	1	2.00	0	0.00	0	0.00	1	2.38	0	0.00	1	3.57	1	1.37
55040	2	4.00	0	0.00	0	0.00	2	4.76	0	0.00	2	7.14	2	2.74
55060	1	2.00	0	0.00	0	0.00	1	2.38	0	0.00	1	3.57	1	1.37
55520	2	4.00	0	0.00	0	0.00	2	4.76	0	0.00	2	7.14	2	2.74
ALL	50	100.00	23	100.00	31	100.00	42	100.00	45	100.00	28	100.00	73	100.00

APPENDIX B

D AND C

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
45300	0	0.00	5	1.27	0	.	5	1.22	0	0.00	5	1.58	5	1.22
52000	0	0.00	19	4.82	0	.	19	4.63	0	0.00	19	6.01	19	4.63
56440	1	6.25	0	0.00	0	.	1	0.24	0	0.00	1	0.32	1	0.24
56600	0	0.00	15	3.81	0	.	15	3.66	0	0.00	15	4.75	15	3.66
57100	0	0.00	14	3.55	0	.	14	3.41	0	0.00	14	4.43	14	3.41
57410	0	0.00	70	17.77	0	.	70	17.07	70	74.47	0	0.00	70	17.07
57454	0	0.00	8	2.03	0	.	8	1.95	0	0.00	8	2.53	8	1.95
57500	0	0.00	108	27.41	0	.	108	26.34	0	0.00	108	34.18	108	26.34
57505	0	0.00	11	2.79	0	.	11	2.68	11	11.70	0	0.00	11	2.68
57510	6	37.50	0	0.00	0	.	6	1.46	0	0.00	6	1.90	6	1.46
57520	9	56.25	0	0.00	0	.	9	2.20	0	0.00	9	2.85	9	2.20
58990	0	0.00	131	33.25	0	.	131	31.95	0	0.00	131	41.46	131	31.95
64435	0	0.00	13	3.30	0	.	13	3.17	13	13.83	0	0.00	13	3.17
ALL	16	100.00	394	100.00	0	.	410	100.00	94	100.00	316	100.00	410	100.00

APPENDIX B

ENTEROLYSIS

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
36491	0	0.00	14	28.00	0	0.00	14	18.92	0	0.00	14	6.39	14	4.86
43820	4	1.68	0	0.00	4	1.87	0	0.00	0	0.00	4	1.83	4	1.39
43830	34	14.29	0	0.00	34	15.89	0	0.00	0	0.00	34	15.53	34	11.81
44020	6	2.52	0	0.00	6	2.80	0	0.00	6	8.70	0	0.00	6	2.08
44021	20	8.40	0	0.00	20	9.35	0	0.00	20	28.99	0	0.00	20	6.94
44050	5	2.10	0	0.00	5	2.34	0	0.00	5	7.25	0	0.00	5	1.74
44120	12	5.04	0	0.00	12	5.61	0	0.00	0	0.00	12	5.48	12	4.17
44130	11	4.62	0	0.00	11	5.14	0	0.00	0	0.00	11	5.02	11	3.82
44140	1	0.42	0	0.00	1	0.47	0	0.00	0	0.00	1	0.46	1	0.35
44300	6	2.52	0	0.00	6	2.80	0	0.00	0	0.00	6	2.74	6	2.08
44305	14	5.88	0	0.00	14	6.54	0	0.00	14	20.29	0	0.00	14	4.86
44320	12	5.04	0	0.00	12	5.61	0	0.00	0	0.00	12	5.48	12	4.17
44600	15	6.30	0	0.00	15	7.01	0	0.00	0	0.00	15	6.85	15	5.21
44620	5	2.10	0	0.00	5	2.34	0	0.00	0	0.00	5	2.28	5	1.74
44960	2	0.84	0	0.00	2	0.93	0	0.00	2	2.90	0	0.00	2	0.69
47100	0	0.00	10	20.00	10	4.67	0	0.00	0	0.00	10	4.57	10	3.47
47600	14	5.88	0	0.00	14	6.54	0	0.00	0	0.00	14	6.39	14	4.86
49000	0	0.00	18	36.00	18	8.41	0	0.00	18	26.09	0	0.00	18	6.25
49255	4	1.68	0	0.00	4	1.87	0	0.00	4	5.80	0	0.00	4	1.39
49505	4	1.68	0	0.00	0	0.00	4	5.41	0	0.00	4	1.83	4	1.39
49550	5	2.10	0	0.00	0	0.00	5	6.76	0	0.00	5	2.28	5	1.74
49560	45	18.91	0	0.00	0	0.00	45	60.81	0	0.00	45	20.55	45	15.63
49565	6	2.52	0	0.00	0	0.00	6	8.11	0	0.00	6	2.74	6	2.08
49581	13	5.46	0	0.00	13	6.07	0	0.00	0	0.00	13	5.94	13	4.51
58940	0	0.00	8	16.00	8	3.74	0	0.00	0	0.00	8	3.65	8	2.78
ALL	238	100.00	50	100.00	214	100.00	74	100.00	69	100.00	219	100.00	288	100.00

APPENDIX B

ENTERECTOMY

	THERAPEUTIC		DIAGNOSTIC		SAME INCISION		DIFFERENT INCISION		USUALLY GLOBAL		NOT GLOBAL		ALL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
PROC														
36010	9	2.28	0	0.00	0	0.00	9	5.23	0	0.00	9	2.25	9	1.83
36491	0	0.00	18	18.18	0	0.00	18	10.47	0	0.00	18	4.50	18	3.65
43830	28	7.11	0	0.00	28	8.72	0	0.00	0	0.00	28	7.00	28	5.68
44005	88	22.34	0	0.00	88	27.41	0	0.00	0	0.00	88	22.00	88	17.85
44015	8	2.03	0	0.00	8	2.49	0	0.00	0	0.00	8	2.00	8	1.62
44020	6	1.52	0	0.00	6	1.87	0	0.00	6	6.45	0	0.00	6	1.22
44021	8	2.03	0	0.00	8	2.49	0	0.00	8	8.60	0	0.00	8	1.62
44050	15	3.81	0	0.00	15	4.67	0	0.00	15	16.13	0	0.00	15	3.04
44130	7	1.78	0	0.00	7	2.18	0	0.00	7	7.53	0	0.00	7	1.42
44140	17	4.31	0	0.00	17	5.30	0	0.00	0	0.00	17	4.25	17	3.45
44305	2	0.51	0	0.00	2	0.62	0	0.00	2	2.15	0	0.00	2	0.41
44320	15	3.81	0	0.00	15	4.67	0	0.00	0	0.00	15	3.75	15	3.04
44600	11	2.79	0	0.00	11	3.43	0	0.00	0	0.00	11	2.75	11	2.23
47600	19	4.82	0	0.00	19	5.92	0	0.00	0	0.00	19	4.75	19	3.85
47605	10	2.54	0	0.00	10	3.12	0	0.00	0	0.00	10	2.50	10	2.03
49000	0	0.00	20	20.20	20	6.23	0	0.00	20	21.51	0	0.00	20	4.06
49020	12	3.05	0	0.00	12	3.74	0	0.00	12	12.90	0	0.00	12	2.43
49255	9	2.28	0	0.00	9	2.80	0	0.00	9	9.68	0	0.00	9	1.83
49505	16	4.06	0	0.00	0	0.00	16	9.30	0	0.00	16	4.00	16	3.25
49530	13	3.30	0	0.00	0	0.00	13	7.56	0	0.00	13	3.25	13	2.64
49535	19	4.82	0	0.00	0	0.00	19	11.05	0	0.00	19	4.75	19	3.85
49550	31	7.87	0	0.00	0	0.00	31	18.02	0	0.00	31	7.75	31	6.29
49560	23	5.84	0	0.00	23	7.17	0	0.00	0	0.00	23	5.75	23	4.67
49565	7	1.78	0	0.00	7	2.18	0	0.00	0	0.00	7	1.75	7	1.42
49581	14	3.55	0	0.00	14	4.36	0	0.00	14	15.05	0	0.00	14	2.84
52005	5	1.27	0	0.00	0	0.00	5	2.91	0	0.00	5	1.25	5	1.01
58940	2	0.51	0	0.00	2	0.62	0	0.00	0	0.00	2	0.50	2	0.41
93503	0	0.00	61	61.62	0	0.00	61	35.47	0	0.00	61	15.25	61	12.37
ALL	394	100.00	99	100.00	321	100.00	172	100.00	93	100.00	400	100.00	493	100.00

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Record Number : 708 Type of Entry: R Project Number: 99-C-98526/1-07

Status : F End Date: 92/08/31 NTIS Number: PB93216133

Author : Boutwell, Robert; Schneider, John

Organization : CHER

Title : Multiple Physicians Furnishing Surgery

Sponsor : HCFA

Project Officer: Dutton, Benson

Keywords : Medicare, physicians, surgery, assistance at surgery

Project Description/Abstract :

Provided a detailed descriptive analysis of the extent to which physicians, other than the primary surgeon, provided separately billable services during a surgery in 1986 and 1989.

Examined the top 100 most frequently used Medicare surgical procedures based on expenditures.

Assessed the extent to which additional physicians would enhance the productivity of the primary surgeon or would be substituted to perform the work that would otherwise be provided by the primary surgeon.

Provided a descriptive analysis of the frequency with which cataract surgery is performed on Medicare beneficiaries on a sequential basis by the same physician.

Assessed the amount of Medicare payment reduction that could be made under a resource-based fee schedule.



